



Health Santé
Canada Canada

Canadian Handbook on Health Impact Assessment:

The Basics



Canada

About the cover illustration:

THE HAUDENOSAUNEE CREATION

Watercolour by Richard W. Hill, Sr.

Tuscarora, Six Nations

The Haudenosaunee Creation Story established the relationship of humans to the universe. We see the universe as a complex web of life, with each being connected in a spiritual way with each other being. The Universe is like a giant sphere, with the top half called the Sky World. Above us is the sky dome, seen in the painting as a beaded curve. Up in that sky world is a great magical tree of life. That tree, seen as the double curve above the woman's head, gives off bright light and has medicinal powers. The Sun, who we call our Elder Brother, and the Moon, who we call Our Grandmother, are connected to that Sky World light. The eagle connects us to that world above.

Once, a woman who lived in the sky world, heavy with child, fell from above and was saved by the water bird who put their wings together to break her fall. The birds placed her on the back of the turtle. She had small plants and seeds from the sky world that she planted in the mud that was placed on the back of the turtle. As she walked in an ever-increasing circle, she planted those seeds. New life was created on the Turtle Island. We live on the back of that giant turtle. We call North America the Great Turtle Island. We call that turtle island, Etinohah – Our Mother, the earth. Below the Turtle Island is a deep ocean with dark and mysterious creatures.

She gave birth to a girl, who herself was impregnated by a Turtle Spirit Man. He placed two arrows over her bed. One had a flint arrow head. She was to have twins, but one seemed to cause her trouble even before he was born.

She could feel the boys wrestling inside her. That twisted-minded boy decided to be born in an unusual way and in doing so killed his own mother. His brother, who was First Born, had a kinder personality and went about creating nice things on the Turtle Island. When the body of the mother was buried, the four sacred plants grew from her body – corn, beans, squash and native tobacco.

Soon those boys held many contests to see who would have authority over the newly created earth. They wrestled with each other. They played lacrosse. They held many contests, but each to a draw. Finally, with help from the deer spirit, the Good-Minded Son defeated his brother and, in doing so, made the earth ready for humans. He took fresh mud from the Mother Earth and shaped two human figures from the clay – a man and a woman. He breathed into them and they came alive. They were the Original People and he taught them the Original Instructions about how to live in harmony with the earth, plants, animals and spirit forces.

The animals represent the family clans of the Haudenosaunee – hawk, heron, deer, bear, wolf, beaver, eel, snipe and turtle. We inherit the clan of our mother. Each clan is headed by the Clan Mother in honour of the Sky Woman and the Mother Earth. The plants represent those that we celebrate and give thanks to through our ceremonies – tobacco, maple tree, corn, beans, squash and strawberries. People are meant to live happy and healthy lives, but we must give thanks for all that the creation provides us and use it sensibly. It is a great gift of life.

CANADIAN HANDBOOK ON HEALTH IMPACT ASSESSMENT

VOLUME 1: THE BASICS

JUNE 1999

*A Report of the Federal/Provincial/Territorial Committee on
Environmental and Occupational Health*

Our mission is to help the people of Canada maintain and improve their health.
Health Canada

Published by authority of the
Minister of Health

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The CEOH has membership from all provinces, territories and the federal government. Membership on the CEOH and Task Force represent environment, health and labour sectors. The Task Force members included:

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PREFACE

Human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

U.N. Conference on Environment and Development
Rio de Janeiro, 1992

The environmental impact assessment (EIA) process is a comprehensive planning process to predict and assess the effects of a proposed project, program or policy. The recently released International Study on the Effectiveness of Environmental Assessment¹ identified social and health impact assessment as areas that are not considered or are inadequately treated in project environmental impact assessment. There has been a tendency in health impact studies to set up curative services to deal with the health problems created by a project instead of setting in place appropriate preventive strategies as an integral part of the original development.²

Human activities are intimately embedded in, and dependent on the natural environment, which is in turn impacted by human activities. Human activities and all our social constructs are a subsystem of the natural environment and are intrinsically dependent on the health of ecosystems. Human health is therefore embedded in and intimately dependent on the natural environment as well. However, environmental quality is only one variable affecting human health. A comprehensive definition of health, such as that provided by the World Health Organization, "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity", acknowledges the influence of the multitude of human social constructs and their complex inter-relationships. The influence of political, social, cultural and economic elements are all crucial determinants of human health. The interplay amongst these and the feedbacks

1. Sadler, B. 1995. *Environmental Assessment: Towards Improved Effectiveness*. International Study of the Effectiveness of Environmental Assessment. Interim Report and Discussion Paper. Unpublished report.

2. Slooff, R. 1995. Consultant's Report. *Commonwealth Secretariat Expert Group Meeting on Health Assessment as Part of Environmental Assessment*. Aberdeen, Scotland, 1-3 February 1995. Commonwealth Secretariat Publications, Marlborough House, London, SW1Y 5HX, ISBN 0-85092-499-9.

developed between them and the natural environment weaves a complex web of factors determining our quality of life, health and well-being. We need to manage human activities to recognize this complexity and evolve societies which can monitor, learn, respond and adapt rather than try to manage and control nature.

The World Health Organization's definition suggests a holistic interpretation of health linking the complex interrelationships between social, economic, political and cultural health determinants with the natural environment. Based on such a comprehensive definition, it is evident a proposed development project has the potential to create significant human health impacts. They may arise from direct and indirect influences of development, and result in cumulative and synergistic impacts, often characterized by complex cause-effect relationships. Given the environmental risks and uncertainties associated with increasing material and energy consumption from human activities, and the intimate relationship between human health and ecosystem health, the ability to predict, assess, understand and monitor the impacts of development projects on quality of life, human health and well-being is becoming ever more imperative.

Development projects are expected to have beneficial effects on health and well-being because they create jobs and provide other economic benefits that contribute to a better standard of living. Although there are exceptions, economic well-being has been repeatedly linked with longevity and other indicators of health because people with adequate incomes can afford to eat balanced diets and live healthier lifestyles. However, development projects also have the capacity to cause adverse effects on health and well-being at the individual and community level. Sometimes these effects are experienced by people who do not share in the project's benefits. One of the negative effects that can be associated with projects is related to physical health, such as mortality and morbidity from disease and injury. Social and community health may also be affected negatively where individuals face a loss of cultural identity and quality of life, social disruption and violence, and a breakdown of community and family support networks. Furthermore, socio-cultural well-being can be affected by increasing stress, anxiety, and feelings of alienation.

Creating changes in a community without learning from, or knowing what the impacts of those changes were, can generate uncertainties within the community leading to a loss of control over and deterioration of the quality of life and health of the community. Whether beneficial or negative, it is important to understand, assess and respond to changes and if possible, prevent or enhance them as determined. Communities might notice a marked decrease in their quality of life and health, yet be incapable of determining when or from what processes these changes emerged. On the other hand, their quality of life may have improved, yet without the knowledge of just where and when these

improvements began, enhancing such changes or duplicating them in the future or in other communities may prove difficult, and attempts to do so may be counterproductive.

Health need not be thought of as the end product of all the endeavours of society. Rather, it works the other way as well. The healthier the population, the more productive the economy will be, and the more sustainable our natural environment and resource base will be.

Roy E. Kwiatkowski
Chief, Office of Environmental Health Assessment
Health Canada

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OVERVIEW OF THE HANDBOOK

Purpose

This Handbook examines the need and the procedure necessary to incorporate the assessment of human health effects in the EA process. The Handbook will make reference to the federal and provincial governments' legislated environmental assessment processes; however, the Handbook is not designed to address specific issues associated with the various legislative regimes. Instead, the Handbook is of a general nature, designed to provide guidance, irrespective of which EA process is used.

Scope

The Handbook seeks to assist individuals with health knowledge in the medical fields, social sciences and government/industry health experts to participate in the environmental assessment process.

Contents

The Handbook provides the answers to some commonly asked questions concerning health in EA. The following presents those questions and directs you to the appropriate section in the Handbook.

- Q:** What is meant by the term "health" and what are the principle determinants of health?
- A:** If you are aware that health encompasses not only the absence of disease or infirmity but also our physical, mental and social well-being, then you are on the right track. But if the nine determinants of health elude you, we encourage you to read Chapter 1.
- Q:** Why do we need environmental assessment (EA)?
- A:** EA is a decision-making tool designed to identify, predict, evaluate and mitigate the ecological and related health, social, economic and cultural implications of proposed human activities. EA legislation exists in each province as well as at the federal level. Please see Chapter 2 for more information about EA and Chapter 4 for information on EA legislation in Canada.

Q: Why should health be incorporated in the EA process?

A: Health needs to be integrated into EA to:

- a) address public concern;
- b) minimize the need for separate health and EA;
- c) ensure cost effectiveness;
- d) minimize the adverse and maximize the beneficial effects on health;
- e) support the concept of sustainable development.

Please see Chapter 2 (page 2-16) for more information.

Q: How do you carry out an EA?

A: Steps to carry out an EA:

1. Describe project and determine whether or not an EA is required.
2. Scope or identify the key issues to be considered in an EA.
3. Assess the potential effects and determine their significance.
4. Identify mitigative measures to prevent, minimize or compensate for the impacts and monitor the project once it is in operation.
5. Make recommendations on the fate of the project and conditions attached to its approval.
6. Provide process for public participation throughout the EA.

For more information concerning the EA process, please see Chapter 2 (page 2-2) and consult the Glossary in the Appendix for definitions.

Q: What types of indicators should be used to assess potential health effects?

A: Baseline and/or predictive (modelling) information needs to be compared to the potential effects likely to be caused by the project. To obtain this information, the types of indicators required are direct measures of health (e.g., cancer incidence, injuries, changes in stress levels, etc.) and indirect measures of health (e.g., levels of toxic chemicals in human tissues, discharges of hazardous substances to the environment, etc.). To get a better understanding of the health indicators for use in EA, please see Chapter 3.

Q: Who takes part in the EA process?

A: The main players in an EA are the proponent, government departments/ministries or agencies, the public, the EA practitioner, including the health professional and decision-makers (please see Glossary). An important segment of the public that can aid in the EA process are Aboriginal peoples since they can contribute traditional knowledge.

Q: Are EAs being carried out only in Canada?

A: Although Canada is a world leader in the field of EA, EAs have evolved into an integral element of environmental policy not only in all of Canada, including Aboriginal lands, but also at an international level. Chapter 4 addresses EA in Canada, Chapter 5 discusses EA on Aboriginal lands and Chapter 6 deals with EA on an international level.

Q: What is the future outlook for health in EA?

A: The ability to sufficiently incorporate health considerations in EA is very encouraging although to date, this has not been achieved. Some of the issues that would assist in achieving this goal include: (a) increasing awareness and education; (b) strengthening cooperation between EA practitioners and health professionals; (c) assessing cumulative health effects; (d) dealing with risk perception; (e) greater public consideration and community action; and (f) improving the follow-up monitoring process. More information surrounding these issues can be found in Chapter 7.

Q: Where can I get more information?

A: At the end of each chapter, further information can be obtained for the topics of the corresponding chapter. Please see "Suggested Readings" at the end of each chapter.

INTRODUCTION

Canada needs economic development to ensure a secure future. In the last 150 years, the production and consumption of Canada's natural resources and the resulting industrialization and urbanization have led to obvious improvements in the standard of living. Yet at the same time, these activities have been linked to new health problems; some related to environmental degradation. Chemicals and wastes contaminate water supplies. Airborne pollutants from industry, cars and other sources are changing the composition of the planet's atmosphere. Overcrowding, inadequate housing and poverty lead to poor sanitation and other health problems. Unsafe working conditions result in accidents, injuries, occupational diseases and lost productivity. It is clear that these activities cannot continue without further impacting human life or human and environmental health.

Canada's Goal

"Ensure that citizens today and tomorrow have the clean air, water and land essential to sustaining human health and the environment."

Life's Three Essentials
Environment Canada

As efforts to enhance health impact assessment with the EA process evolves, concerns grow about the data/information which must be gathered to meet scientific, political, public or legislative requirements. The resources required to obtain this data/information is also of concern. Development of a consistent scientific approach to environmental/human health impact assessment will focus efforts and diminish resource requirements, providing better information for decision-makers and the public.

To promote the concepts of health impact assessment within Canada, the Federal/Provincial/Territorial Committee on Environmental and Occupational Health (which has membership from health, labour and environment) established a Task Force (four federal and four provincial representatives) in September of 1992. The Task Force was asked to produce guidance material to help proponents of projects, intervenors, government agencies, and EA practitioners identify valued components within environmental/human health assessment.

Mandate of Task Force:

- To provide advice, share information and foster communication among federal, provincial and territorial agencies, industry, universities and consultants on health impact assessment (HIA).
- To encourage coordination and harmonization of approaches to HIA.
- To improve awareness of the linkages among environmental, socio-economic, cultural and human health effects.
- To carry out workshops to address specific information exchange needs on HIA.
- To assess the need for a registry of databases on HIA.

Principles to be followed by the Task Force:

- The World Health Organization's definition of health is accepted by the Task Force.
- Environmental and human health are inextricably interlinked and therefore, HIA is an integral part of Environmental Impact Assessment (EIA).
- A cornerstone of HIA is the recognition of the need for public participation in the definition and scoping of human health concerns, and in decision-making.
- HIA is required throughout the life cycle of the project (planning, construction, operation, decommissioning and follow-up monitoring) and takes into consideration occupational health and safety.
- Development of a scientific approach to HIA will focus efforts and diminish resource requirements, providing a fair, effective and efficient process of information gathering for decision-makers and the public.
- Educational tools are required to promote or increase awareness of environmental/human health assessment, risk assessment and communication, and the linkages among environmental, social, economic, cultural and human health effects.

Six regional, multi-sectoral workshops, sponsored by the Task Force, were held in 1995 and 1996.¹ There was a consensus at all of the workshops that guidance material on health impact assessment within EA is needed in Canada and that it should include advice on assessing effects on socio-cultural health

1. Health Impact Assessment Task Force: Federal/Provincial/Territorial Committee on Environmental and Occupational Health. *The Role of Health Professionals in Environmental Assessment – Consolidated Workshop Proceedings*. June, 1996.

and occupational health, as well as physical health. This would be consistent with the World Health Organization's definition of health and the known determinants of health.²

It was suggested that because different people have different levels of familiarity with the issues associated with including health in EA, there may be a need to prepare more than one guidance document. Participants stressed that the guidance material should be flexible and adaptable to circumstances in different provinces and that it should not be prescriptive.

The Task Force decided that three volumes were needed to meet the requirements stakeholders identified. This volume, entitled: *Canadian Handbook on Health Impact Assessment Volume 1: The Basics*, focuses on the need for and components of HIA within EA. It does not address the need for or components of EA directly, other than where necessary to understand the role of HIA. Reference documents on EA should be obtained from the Canadian Environmental Assessment Agency for the federal EA process and the EA Administrators for provincial EA processes.

Volume 1, *The Basics* presents the nature and necessity of incorporating health into environmental assessment within several chapters. Chapters 1 and 2 introduce the basic concepts inherent to health and environmental assessment and lay the groundwork for the remainder of the Handbook. Chapter 3 discusses environmental health indicators as valuable tools to assess and predict the impacts of projects. Chapter 4 examines EA within a Canadian context by providing an overview of Canadian federal and provincial legislation and regulation. Chapter 5 deals with Aboriginal health and examines the concept of traditional knowledge. Chapter 6 takes a peek at EA on an international level and finally, Chapter 7 looks at the future challenges that lie ahead and the necessity to effectively incorporate health considerations into EA. The underlying theme of all of the chapters is that full health considerations need to be incorporated into the EA of projects.

Details on Volumes 2 and 3 of this Handbook are provided in Chapter 7. Volume 1, as well as revisions and updates, are available by Internet at:

<http://www.hc-sc.gc.ca/oeha> (english);

<http://www.hc-sc.gc.ca/behm> (french).

2. Federal, Provincial and Territorial Advisory Committee on Population Health, 1994. *Strategies for Population Health: Investing in the Health of Canadians*. Minister of Supply and Services Canada, 1994.

1

LEARNING THE BASICS ABOUT HEALTH

To effectively incorporate health considerations into an environmental assessment, it is necessary to understand some basic concepts. As such, this Chapter will:

- Define health
- Outline and examine the determinants of health
- Discuss beneficial and adverse effects of projects on health
- Suggested readings

Defining Health

Our health is primarily our own responsibility. Government's job is to provide citizens with accurate and appropriate information so that they can protect themselves. People have their own idea about what is meant by the term "health". Acknowledging a specified definition of health, however, is the first step to promoting consistent procedures. Federal and provincial governments and health officials have accepted the World Health Organization's (WHO) definition of health:

Health

"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"

World Health Organization, 1967

and,

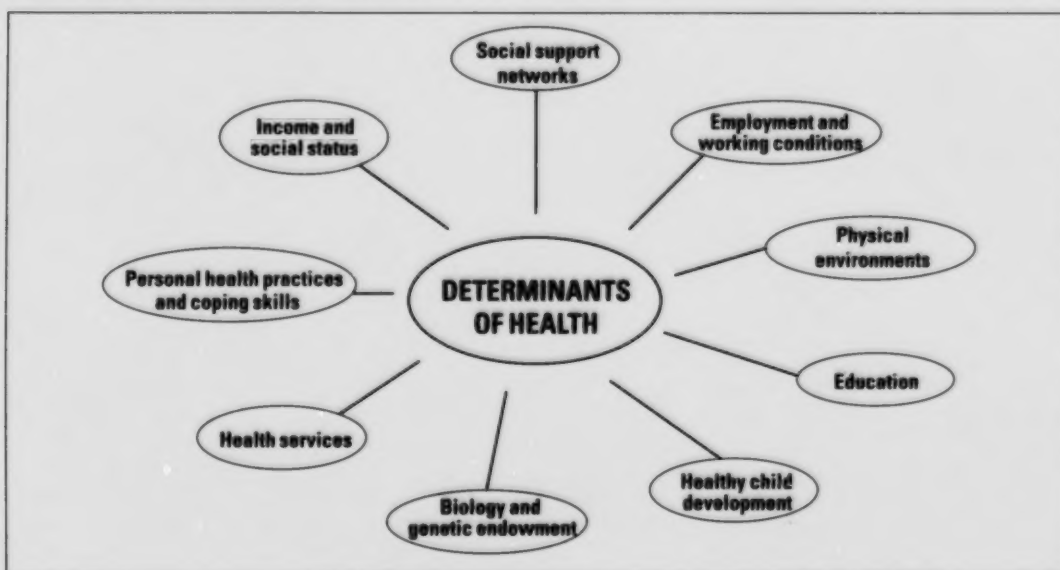
"the extent to which an individual or a group is able, on the one hand, to realize aspirations and to satisfy needs, and on the other, to change or cope with the environment"

World Health Organization, 1984

Outlining and Examining the Determinants of Health

This definition of health clearly indicates that health is more than the absence of sickness and disease. Health encompasses social, economic, cultural and psychological well-being, and the ability to adapt to the stresses of daily life. A recent Canadian report by the Federal, Provincial and Territorial Advisory Committee on Population Health (1994), examined the issue of what makes people healthy and identified the "determinants of health" shown in Figure 1.1:

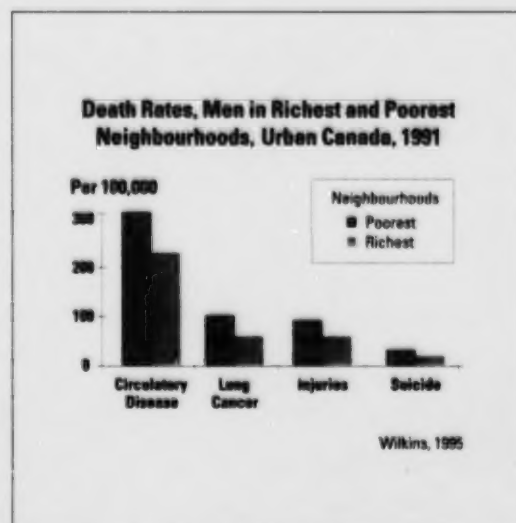
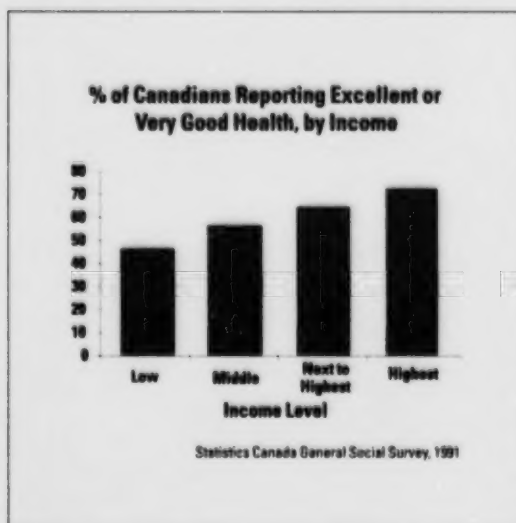
Figure 1.1
Outlining the Determinants of Health



A closer examination of the determinants of health as identified by the Federal, Provincial and Territorial Advisory Committee on Population Health might clarify why they are so important to our health and happiness. Four of these categories – income and social status, education, biology and genetic endowment, and personal health practices and coping skills – relate to the individual whereas the other five categories relate to the collective conditions that provide the basis for the individual categories. Although these factors are important in their own right, they are interrelated.

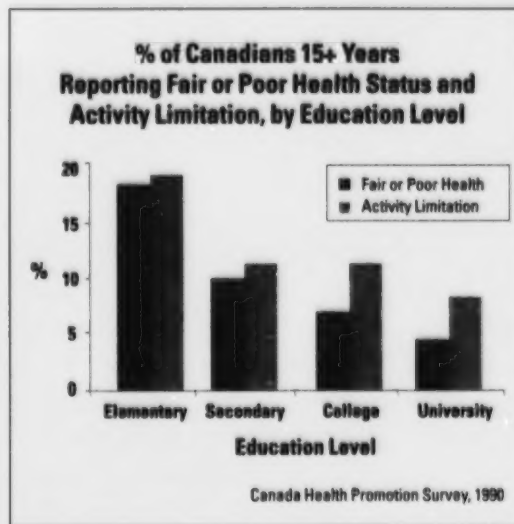
Income and Social Status

Growing evidence from the Federal, Provincial and Territorial Committee on Population Health indicates that income and social status is the most important determinant of health. People perceive themselves as being healthier the higher their socio-economic status and the higher their income level. This may be surprising considering we have a health system that provides virtually equal access for all Canadians, regardless of their income. Yet studies in provinces and cities throughout Canada consistently indicate that there is not only a difference between people in the highest and lowest income scale, but that people at *each* step on the income scale are healthier than those on the step below. Furthermore, many studies demonstrate that the more equitable the distribution of wealth, the healthier the population, regardless of the amount spent on health care.



Education

For a variety of reasons, health status improves with an increasing level of education. Education improves opportunities for employment, income, job security and job satisfaction and equips people with knowledge and skills necessary for problem solving. People also have more control over their work environment and are better able to access and understand information to help them stay healthy.



Employment and Working Conditions

Unemployment is linked to poorer health: the unemployed experience significantly more psychological distress, anxiety, health problems, hospitalization, etc., than the employed. Within the employed population, however, other factors that negatively affect health include stress-related demands of the job and the frequency of deadlines. Workplace support is measured by the number and quality of interactions with co-workers. The more connections people have, the better their health. Finally, workplaces that are not conducive to preventing workplace injuries and occupational illnesses also decrease health status.

Physical Environments

Health is critically dependent on the elements in the natural environment such as the air we breathe, the water we drink, and the food we eat. Factors in our human-built environment such as housing, workplace and community safety have equally important influences on health.

Biology and Genetic Endowment

The organic make-up of the body, the functioning of various body systems and the processes of development and aging serve as fundamental determinants of health. Biological differences between the sexes and the traits and roles that society ascribes to females and males form a complex relationship between individual experience and the development and functioning of key body systems. At the same time, genetic endowment predisposes certain individuals to particular diseases or health problems.

Social Support Networks

The support which families, friends, and communities provide contributes to improved health. Social support networks can help people cope with daily stresses and solve their problems. "The caring and respect that occurs in social relationships, and the resulting sense of satisfaction and well-being, seems to act as a buffer against health problems" (Strategies for Population Health, 1994).

"Studies show that the more social contacts people have, the lower their premature death rates."

Berkman, 1979

Overall, most Canadians report access to a substantial level of support. Females reported a higher level of support (86%) than males (80%). High support was found to be most prevalent in adolescents with a gradual decline of support with age.

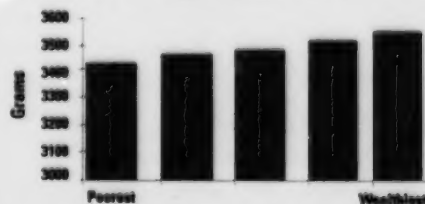
Personal Health Practices and Coping Skills

Social environments that promote healthy choices and lifestyles are linked to improved health. A balanced diet and regular exercise have been shown to provide substantial health benefits while tobacco and excessive consumption of alcohol are linked to many of the most common health problems. The way people react to stresses and events which they encounter in their day-to-day lives demonstrates their coping skills and how self-reliant or able they are in solving problems to make informed choices that enhance health.

Healthy Child Development

The significant decreases in maternal and infant death rate over the last 60 years have had a profound impact on Canadians' life expectancy. Mounting evidence indicates that prenatal and early childhood experiences have a powerful influence on subsequent health, well-being, coping skills and competence. Not only are infants with low weights at birth more susceptible to infancy deaths, neurological defects, congenital abnormalities and retarded development, they also experience negative effects later in life which can include premature deaths. Of further interest, a strong correlation exists between a mother's level of income and the baby's birth weight; mothers at each step up the income scale have babies with higher birth weights, on

Mean Birthweight, Uncomplicated Pregnancies
with Adequate Care,
by Income Group (1987-88 Manitoba)



Manitoba Centre for Health Policy and Evaluation, 1992

average, than those on the step below. Finally, the degree of prenatal care at an early age also influences a child's coping skills and health for the rest of their lives.

Health Services

Health care services contribute to health status, particularly when they are designed to maintain and promote health and prevent disease. Services such as prenatal care, immunization and those that serve to educate children and adults about health risks and choices all serve to improve health. On the flip side, environmentally sustainable practices can improve population health and help reduce costs to the health care system.

In 1994, Canada spent an estimated \$72.5 billion on health, or \$2,478 per person.

Health Canada, 1996

The determinants of health, specifically the living and working environments, community cohesiveness and health services are important factors in shaping the health and well-being of an individual or a community. At the same time, economic development provides jobs, income

and social status which can promote health by allowing the community to afford and promote well-being. As such, individuals accept a huge responsibility in shaping their health.

Health Promotion

"Health promotion" through community support is an important method enabling people to gain greater control over the determinants of their own health. This concept is also tied to the social learning theory which supports the notion that people self-regulate their environments and actions; and

"Health promotion is the process of enabling people to increase control over and improve their health."

CPHA, 1995

despite being acted upon by the environment and their surroundings, people also create their surroundings (Green & Kreuter, 1991).

Improving community health also requires collaboration among a variety of sectors – not only for the general population, but particularly for vulnerable groups which experience lower health status than others. Gender is gaining recognition as another determinant of health because of the lower health status experienced by women. Lower

income and social status, longer lifespans implying more disability and illness than men, and increasing stresses between work and tending to the family negatively affect women and lower their health status. Of greater severity, Aboriginal

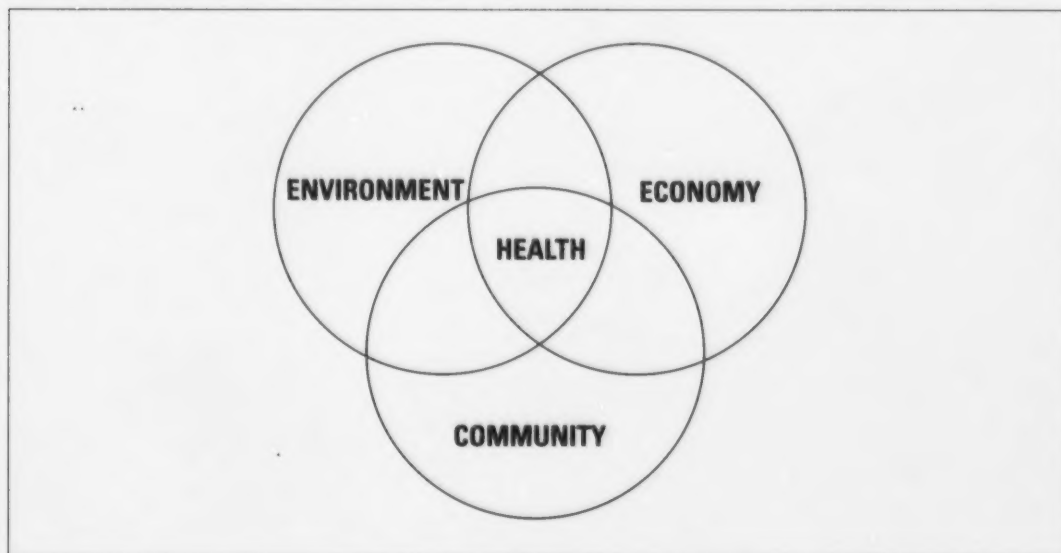
peoples have the poorest health status among Canadians. Aboriginal people experience significantly higher infant death rates and much higher disease rates than the rest of Canada. As such, government and non-government organizations need to work together to implement strategies targeting vulnerable groups. Community initiatives, particularly at the local level have proven to be an effective means of improving health.

Investing in a population health approach offers benefits in three main areas:

- increased prosperity because a healthy population is a major contributor to a vibrant economy;
- reduced expenditures on health and social problems; and
- overall social stability and well-being for Canadians.

With this in mind, one is able to understand how the environment, economy and community are interrelated with health. Figure 1.2 provides a holistic or EA approach which recognizes that economic health, environmental health, and the health of the community are inextricably linked.

Figure 1.2
Holistic Approach of EA (modified from Hancock, 1990)



Human health depends in a fundamental way on the environment as both a source of resources and a sink for wastes. It is also true that environmental quality is more likely to be properly respected if the economy is healthy. In the past, most decision-making for health, the environment and economic development has been conducted separately. The challenge now is to better understand the links between health, the environment and economic development, and to develop ecosystem-based decision-making processes that integrate these considerations. Environmental assessment (EA) is recognized within Canada, as well as internationally, as a primary decision-making tool for maintaining and enhancing environmental quality while carrying out economic development.

Beneficial and Adverse Effects of Projects

Most projects requiring EA are expected to have beneficial effects on health and well-being because they create jobs and provide other economic benefits that contribute to a better standard of living. Although there are exceptions, economic well-being has been repeatedly linked with longevity and other indicators of health because people with adequate incomes can afford to eat balanced diets and live healthier lifestyles. As well, a health economy is necessary to pay for health care services.

Projects also have the capacity to cause adverse effects on health and well-being at the individual and community level. Sometimes these effects are experienced by people who do not share in the project's benefits. One of the negative effects that can be associated with projects is related to physical health, such as mortality and morbidity from disease and injury. Social and community health may also be affected negatively where individuals face a loss of cultural identity and quality of life, social disruption and violence, and a breakdown of community and family support networks. Furthermore, socio-cultural well-being can be affected by increasing stress, anxiety, and feelings of alienation.

Now that health and the determinants of health have been identified, we will look at environmental assessment (EA) and discuss the health component within the stages of EA.

Suggested Readings

- Adams, O. Health Status. In Health and Welfare Canada, Stephens, T., Fowler, Graham D. (eds). *Canada's Health Promotion Survey 1990: Technical Report*. Ottawa: Minister of Supply and Services Canada, 1993, Cat. No. H39-263/2-1990E.
- Berkman, L. and Syme, S.L. *Social Networks, Host Resistance and Mortality: A Nine-Year Follow-up Study of Alameda County Residents*. *American Journal of Epidemiology*, 109(2), 186-204, 1979.
- Canadian Public Health Association. *Perspectives on Health Promotion*. CPHA, Ottawa, Ont., Canada, July 1995.
- Federal, Provincial and Territorial Advisory Committee on Population Health. *Strategies for Population Health: Investing in the Health of Canadians for the Meeting of Ministers of Health*. Minister of Supply and Services Canada, Halifax, Nova Scotia, Sept. 14-15, 1994.
- Federal, Provincial and Territorial Advisory Committee on Population Health. *Report on the Health of Canadians for the Meeting of Ministers of Health*. Minister of Supply and Services Canada, Toronto, Ontario. Sept. 10-11, 1996.
- Green, L., Kreuter, M. *Health Promotion Planning: An Educational and Environmental Approach*. Mayfield Publishing Company, 2nd ed., 1991.
- Guernsey, Judith Read. *Summary Report: Act! For a Healthy Sydney*. Dalhousie University Faculty of Medicine. Halifax, Nova Scotia. April 1996.
- Hancock, T. *Toward Healthy and Sustainable Communities: Health, Environment and Economy at the Local Level*. Third Colloquium on Environmental Health. Quebec City, Quebec. November 22, 1990.
- Health Canada. Policy and Consultation Branch (1996, January). *National health expenditures in Canada 1975-1994, Summary Report*. Cat. No. H21-99/1994-2. Ottawa, Ontario. Minister of Supply and Services Canada.
- Health and Welfare Canada. *A Vital Link: Health and the Environment in Canada*. PWGS. Ottawa, Canada, 1992.
- Statistics Canada. *General Social Survey, Cycle 6: Health Status of Canadians 1991*. Public use microdata file, original analysis.

- Thomas Stephens & Associates for the Federal, Provincial and Territorial Advisory Committee on Population Health. *Report Card on the Health of Canadians: Technical Version*. October 1995.
- Wilkins, R. *Mortality by neighbourhood income in urban Canada, 1986-1991*. Poster presented at the Conference of the Canadian Society for Epidemiology and Biostatistics (CSEB). St. John's, Nfld. 16-19 August 1995.
- World Health Organization. *The Constitution of the World Health Organization*. World Health Organization Chronicles 1:29. 1967.
- World Health Organization. *Health Promotion: A Discussion Paper on the Concept and Principles*. World Health Organization Regional Office for Europe. Copenhagen, Denmark, 1984.
- World Health Organization. *WHO Global Strategy for Health and Environment*. Geneva, Switzerland, 1993.

2 **LEARNING THE BASICS ABOUT EA**

- Defining environmental assessment (EA)
- Identifying the players in EA
- Providing an EA schematic
- Description of the steps in the EA schematic and examining health within the specified stages of EA
- Health as an integral component of EA
- Suggested readings

Getting Started: Defining Environmental Assessment (EA)

Since its inception in the early 1970s, EA has become an effective decision-making tool to assist decision-makers in ensuring the integration of economic development and important environmental issues. EA is designed to anticipate and prevent adverse effects of projects. Simply put, EA involves determining any changes or impacts that a project or action will have on our surroundings – be it positive or negative effects – before that project is carried out in order to prevent irrevocable damage from occurring. Thus, environmental assessment¹ can be defined as:

1. For the sake of convenience, this Handbook will use the term “environmental assessment” (EA) synonymously with the term “environmental impact assessment” (EIA), environmental assessment review and impact assessment.

Environmental Assessment (EA)

a comprehensive and systematic process, designed to identify, analyze and evaluate the environmental effects of a project in a public and participatory manner; environmental assessment involves the use of technical experts, research and analysis, issue identification, specification of information requirements, data gathering and interpretation, impact prediction, development of mitigative proposals, design of any required follow-up monitoring, external consultations, and report preparation and review

Identifying the Players in an EA

The question now turns to those involved in an EA. A number of areas of expertise are required in an EA. There are essentially five main players in an EA, namely: (1) the proponent (the individual, company or organization that proposes a development project); (2) government departments/ministries or agencies, including local and regional authorities; (3) the public; (4) the EA practitioner, including the health professional; and (5) decision-makers. Further details of these main characters involved in an EA can be found in the Glossary.

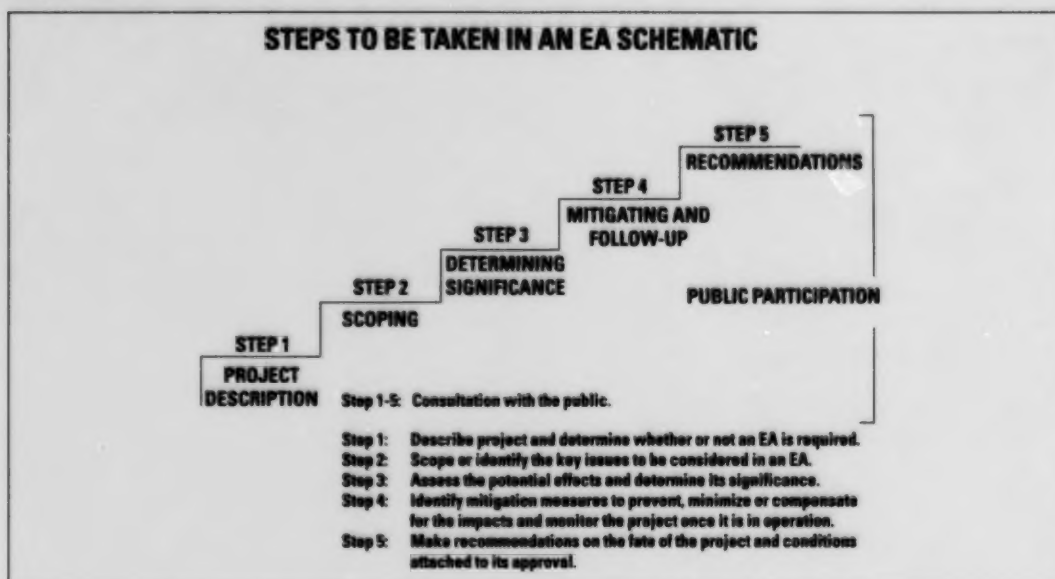
Providing an EA Schematic

EA requirements and processes vary, not only internationally, but provincially as well. However, many common procedural elements exist within Canadian EA processes. These are schematically outlined in Figure 2.1. Depending on the jurisdiction, these steps can be combined or be complementary.

Description of the Steps in the EA Schematic and Examining Health within the Specified Stages of EA**Step 1: Project Description**

The project description will provide the basic information – the who, what, when and where – regarding the project. This information presented by the proponent should offer sufficient information to anyone not familiar with the project. Data which can be included at this stage are:

Figure 2.1



- the rationale, objectives and goals of the project;
- a description of the project including the processes, chemicals and types of equipment to be used and the building layout;
- sufficient detail of the planning, designing, construction, operating, maintenance and decommissioning phases;
- types and quantities of inputs (energy, water and chemicals used in the industrial process) and outputs (products and waste materials) and a brief discussion of their treatment and disposal;
- expected infrastructure, local facilities and services (e.g., electricity, water, sewage, roads);
- advantages and drawbacks associated with the project.

At this stage, a determination as to whether or not the project is subjected to an EA is made. Who makes that decision varies with jurisdiction. EA administrators (part of the Ministry of Environment within the provincial regime) make that decision within the provincial EA processes, while within the federal EA process, the manager responsible for the project (irrespective of which department) makes the decision. It is important that the project description also focus on the features that will likely generate public concern. Projects that are prone to trigger health concerns are those associated with mining, agriculture, energy production, natural resource management, waste management, chemical

production and manufacturing processes. Public sector projects such as infrastructure and urban development (airports, highways, railways and utilities) are further examples of areas that usually raise concerns about the health effect implications.

The scope of possible effects on occupational and public health are shown in Table 2.1.

Table 2.1
Health Factors to Be Considered in the Project Description

	Factors to Consider
Project	Location, environmental setting. Different stages of the project's life cycle (e.g., construction, operation, maintenance and decommissioning). Different project activities (e.g., transportation of raw materials and products, processing of materials and waste management). The manufacture, use or disposal of chemicals or microbiological organisms, including products of biotechnology. Physical hazards associated with the projects, such as noise, dust or radiation.
Human Exposure	The potentially affected populations, including workers and the public. Any especially vulnerable groups that could be exposed such as Aboriginal peoples, children, pregnant women and hypersensitive individuals. Expected changes in human exposures and the effects of the project on total human exposures. Any changes in human contact with communicable diseases or their vectors (e.g., mosquitoes, rodents).
Possible Effects	Possible effects on the physical health of potentially exposed populations. Possible effects on socio-cultural well-being. Possible effects on health care facilities and occupational health services.

Ideally, the project description should be prepared by the proponent and an EA practitioner who has a thorough understanding of environmental and health issues.

Step 2: Scope

The scope of an EA is analogous to an EA workplan. It lays the foundation for an effective EA by identifying significant issues and the potential environmental effects that the project might have on the biophysical and social environment, including any health issues that need to be assessed. A properly defined, scoped project improves the efficiency and effectiveness of the EA and focuses efforts on issues deemed important by the public and the experts.

Unfortunately, the process used to scope a project is not an exact science and is not always carried out in a disciplined or consistent fashion. As a result, important health issues are sometimes not identified, or identified too late for a thorough health assessment to take place. Furthermore, if health issues are overlooked, individuals can be hostile to the proponent for neglecting an issue during public consultation, thus jeopardizing the proponent's credibility.

There are essentially four major objectives of scoping. These are:

- determining the factors to be considered, alternatives to the project, and the potential effects of the project to be considered;
- prioritizing the issues to be addressed in the EA;
- setting appropriate boundaries for the EA study; and
- determining the appropriate level of effort for the EA.

The first objective of scoping is to determine the significant environmental and health effects, and factors and alternatives to be considered. This objective is paramount as it helps the proponent focus time and resources on the essential environmental and health concerns raised by the project.

Boundaries:

Spatial boundaries are set on the basis of the geographical limits of the impacts.

Temporal boundaries deal with the timing and the life span of the impacts arising from the project.

Jurisdictional boundaries refer to the legal requirements that the project must adhere to.

Canter, 1986

A second objective of scoping is the prioritization of issues identified in the first objective. It would be impractical for an EA to address every single potential effect or to discuss all of the alternative means of carrying out the project to the same level of detail. Prioritizing the issues from a list of potential problems should be achieved in consultation with the public and experts. Clearly, it is unfair to claim that a proponent has not adequately addressed an issue if the issue was not clearly raised, and the importance of addressing it was not established during scoping sessions. Another difficulty associated with the prioritization of

issues is that opinions of the project proponent and the public may differ with respect to the impacts; (i.e., where the project proponent might view a health issue as being inconsequential, the public may place a higher priority to that risk).

A third objective of scoping involves setting realistic and appropriate spatial, temporal and jurisdictional boundaries on what is to be included or excluded in the EA. A problem commonly faced with large boundaries is that if the project is scoped too broadly, it will be very difficult to assess. The proponent can also feel that it is unattainable with the limited time and resources. If the project is scoped too narrowly, it can miss some potential effects. This can upset the public who may feel that important environmental and social issues are being neglected. For this reason, boundaries should be reasonable. Criteria used to determine appropriate spatial and temporal boundaries can include:

- the size and nature of the project;
- the environmental effects of relevant past, existing and future projects in the area which, in combination with the proposed project, would suggest that cumulative effects occur;
- the availability and feasibility of existing data; and
- the characteristics of the environment in which the project will occur (e.g., aquatic boundaries such as watershed, habitat, land use).

The fourth objective of scoping involves determining the appropriate level of effort for the EA. This can be largely determined by the same criteria as those used to determine appropriate spatial and temporal boundaries and should be consistent with the magnitude and severity of the potential effects caused by the project.

Many factors will determine the types of health effects identified during the scoping stage. Table 2.2 outlines several factors of health that have been considered during the scoping stage of an EA.

Table 2.2
Factors of Health Considered in EA

Factor	Characteristics
Hazardous agents	Microbiological virus, bacteria
	Chemical – heavy metals and toxic organic chemicals
	Physical – noise, dust, radiation, vibration
Environmental	Changes in the quality or availability of water, food, air, land and soil
	Waste management practices
	Physical safety and security
	Disease vectors
Exposure conditions	Human exposure pathways – food, air, water, etc.
	Public exposure
	Occupational exposure
	Identification of high-risk groups
Effects on physical health	Mortality
	Morbidity – communicable and non-communicable diseases, acute and chronic effects
	Injuries and accidents
	Effects on future generations
	Effects on high-risk groups (i.e., due to exposure or sensitivity)
	Exacerbation of existing health conditions (e.g., asthma)
	Cumulative effects
Effects on health care services	Incremental health care needs
	Displacement of traditional health care services
Effects on social well-being	Effects on income, socio-economic status and employment
	Effects on municipal revenues and local industries
	Migration and re-settlement
	Effects on social and community health including effects on culture and way of life
	Effects on services (e.g., education, social support networks, etc.)
	Effects on psychological well-being (e.g., stress, anxiety, nuisance, discomfort)
	Beneficial effects on health

Step 3: Determining Significance

Predicting the potential impacts and determining their significance is a key step to project approval and condition setting, and in choosing among alternatives. This step involves assessment of the potential health, environmental and social effects of the project, interpreting information and providing advice on the significance of effects to the decision-makers.

Baseline Health Status:

"Baseline status" refers to the conditions prior to the construction and/or operation of the project.

Once issues of concern have been identified through scoping, baseline health status of the population that will be affected must be obtained. The baseline health status of the potentially affected population, particularly sensitive sub-groups such as workers, Indigenous people, children, pregnant women and the elderly, is needed to assess the potential impacts of the project on health and well-being.

The baseline health status is also essential to monitor the changes to environmental health once the project is in place.

The types of quantitative and qualitative information that should be used to describe baseline environmental, health and social conditions are shown in Table 2.3.

Table 2.3

Types of Information Used to Describe Baseline Environmental, Health and Social Conditions Related to the Determination of Human Health Impacts

	Types of Information
Environmental conditions	Levels of environmental contaminants in air, water, soil and biota
	Resources or species that are important for commercial or other reasons
	Community infrastructure, such as drinking water, sewage treatment, solid waste management, transportation and housing
	Local amenities, recreational facilities and sites of historical, cultural or religious significance

Table 2.3 (Cont'd)

	Types of Information
Health and social conditions	The demographic characteristics of the potentially affected population(s) including their size, cultural origins, education, age structure, socio-economic status, patterns of employment and work experience
	Current health status of the potentially affected population(s) including information on their physical health and psycho-social well-being
	The local health care and occupational health services
	The characteristics of any incoming groups of people, such as construction workers
	The history of the potentially affected population(s) in relation to development
	Any distinguishing, unique or traditional behaviours, lifestyles or ways of life in the local community or the potentially affected populations

Baseline data usually rely on existing available health information. Relying on this type of information can raise certain problems:

- Health information is collected for specific purposes and is not usually adaptable for use in EA. For example, medical data rarely distinguish between new health problems and repeat visits for the same condition – useful for consideration in EA.
- There is often a lack of information on health statistics at the community level.
- Precisely how the environment affects health is still in its infancy, therefore, existing health information is rarely related to environmental quality.
- Confidentiality of data especially where one is dealing with a small population where individuals might be identified from the data set.

Although there are difficulties in locating appropriate health information, there are health indicators presently of use in EA. The following chapter will discuss this issue in greater detail.

Assessing the Impacts:

Once the baseline health status has been determined, assessing the impact and determining significance is the next step. Criteria for assessing and determining the significance of adverse health effects can be found in Table 2.4.

Table 2.4
Criteria for Assessing Impact Significance (Canter, 1986)

Nature of the Impact	Definition
Magnitude	The probable severity of each potential adverse impact, in the sense of degree, extensiveness or scale. How serious is the impact? Does it cause a large change over baseline conditions (e.g., will crime rates double?) Does it cause a rapid rate of change – large changes over a short time period? Will these changes exceed local capacity to address or incorporate change? Does it create a change which is unacceptable? Does it exceed a recognized threshold value?
Geographical limits	This is the extent to which the potential impact may eventually extend (e.g., local, regional, national, global), as well as, to geographical location (e.g., far North, reserve, etc.)
Duration and frequency	The length of time (day, year, decade) for which an impact may be discernible, and the nature of that impact over time (is it intermittent and/or repetitive?) If repetitive, then how often?
Cumulative impact	The potential impact that is achieved when the particular project's impact(s) are added to impacts of other projects or activities that have been or will be carried out. The purpose being to predict whether or not a threshold level is surpassed.
Risk	The probability/predictability of an impact occurring. For many socio-economic impacts, qualitative assessments would be appropriate (high, medium, low).
Socio-economic importance	The degree to which the potential effects may (or be perceived to) impact on local economies or social structure.
People affected	How pervasive will the impact be across the population? This criterion should be used to assess both the percentage of the population affected and the extent to which it will affect different demographic groups, particularly the vulnerable groups (e.g., Aboriginal groups, children, elderly, pregnant women, etc.).
Local sensitivity	To what extent is the local population aware of the impact? Is it perceived to be significant? Has it been a source of previous concern in the community? Are there any organized interest groups likely to be mobilized by the impact?
Reversibility	How long will it take to mitigate the impact by natural or man-induced means? Is it reversible, and, if so, can it be reversed in the short or long-term?
Economic costs	How much will it cost to mitigate this impact? Who will pay? How soon will finances be needed to address this impact?
Institutional capacity	What is the current institutional capacity for addressing the impact? Is there an existing legal, regulatory, or service structure? Is there excess capacity, or is the capacity already overloaded? Can the primary level of government (e.g., local government) deal with the impact or does it require other levels or the private sector?

Health-based guidelines and objectives can be used to provide advice on the significance of potential adverse health effects. Guidelines and objectives have been developed for environmental and occupational hazards, including noise level, contaminants, radiation and microbiological agents. Useful guidelines include Health Canada's *Guidelines for Canadian Drinking Water Quality* and the *Guidelines for the Management of Wastes Containing PCBs* under the Canadian Council of Ministers of the Environment (CCME). Predicted levels are insignificant or have little effect if they fall below the level as specified by the guidelines or objectives.

Health-based guidelines and objectives provide a straightforward means of predicting impacts, but they do not exist for every possible environmental health hazard. Reasons why guidelines and objectives should be used with caution include:

- they are set to protect against specific types of health effects (e.g., common acute effects and cancer) but do not guarantee protection from all types of adverse health effects;
- they are usually set for individual hazardous agents; however, people are often exposed to mixtures;
- they have not been developed for all environmental hazards and they do not address the social, community or psychological dimensions of health and well-being effectively; and
- finally, health-based guidelines and objectives do not necessarily account for the age and sex of a person. For instance, children, the elderly and pregnant women can be more vulnerable to environmental hazards.

If no regulatory standards or objective criteria are available, other modes of evaluation should be used. Other approaches that can be used to assess a project's potential effects on health can be a balance between expert judgment and experience, risk-based analyses, public input, literature reviews, and case studies of effects associated with other similar projects.

Often, the evaluation of impact significance is seen as an ambiguous area of practice. Scientists and health professionals can evaluate significance of impacts differently or judgments can be subjective and contingent upon social values.

Social Impact Assessments:

Assessing the effects on socio-cultural well-being has often been referred to as social impact assessments (SIA). SIAs are conducted to examine the effects of projects on social and related economic conditions, such as employment, demographics, behaviour and lifestyle. Although SIAs are normally part of most EAs

for medium-sized and large projects, the approaches and methods used have evolved separately from those used for health. If the World Health Organization's definition of health is to be reflected in EAs, SIAs should be seen as part of the health component of EAs.

Occupational Health:

EAs should also address the potential effects on occupational health. In most Canadian jurisdictions, occupational health is usually assessed in EA. However, occupational health concerns are sometimes dealt with only later in project approval processes, such as facility licensing or permitting. It is important to include occupational health in EA because mitigative measures (design changes) to protect worker health are often more easily incorporated at the EA stage than at the facility licensing or permitting stage.

As well, in some cases, measures to protect occupational health may have a spill-over effect and result in improved protection for public health. Although occupational and public health concerns should be assessed in the same EA, the actual assessments need to be done separately. This is because occupational exposures are likely to be different from public exposures, and because occupational populations are different from the general public, since they are largely comprised of healthy adults. However, this information must come together within environmental assessment for decision-makers.

Health promotion (focusing on behavioral change strategies) versus health protection (efforts for making worksites safer) is an issue that has proven challenging when dealing with the occupational health and safety of workers. Increasing health promotion in the workplace is ineffective if efforts to make worksites safer (i.e., addressing the hazards of work) are minimal. Similarly, a health protection program that does not consider personal risk factors or wellness programs is equally ineffective. Consequently, an integrated approach to health promotion and health protection which includes joint worker and management participation in program planning and implementation, consultation with workers about worksite changes, and coordinated educational programs targeting health behaviour change is essential to promote worker health and safety.

Step 4: Determining Mitigation and Follow-Up

This stage focuses on two aspects. Mitigation, which is necessary to eliminate or to reduce to acceptable levels the predicted impacts, and follow-up monitoring, to verify the accuracy of the predicted impacts and modify the mitigation measures if need be.

Mitigation:

Mitigation measures are usually required to address significant adverse effects. If adverse impacts cannot be avoided or prevented, then minimizing these effects through mitigation is sought. If this is not attainable, compensation which usually takes the form of monetary payments, for damages caused by the project can be utilized. Monetary payment, or compensation does not reduce the environmental impacts but serves to financially compensate the individual(s) for tolerating the negative impact.

The severity of the effects as well as environmental, social, cultural, political and economic conditions will all play a role in choosing appropriate mitigation measures as well as local circumstances and acceptability by the potentially affected populations. When responsibility for designing and implementing mitigation measures lies outside the health sector, health professionals should provide advice on the likely effectiveness of the measures for managing health risks to those responsible for the mitigation measures.

Mitigation is "the elimination, reduction, or control of a project's adverse environmental effects, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means".

CEAA, 1992

Follow-up:

The purpose of follow-up is to verify the accuracy of the environmental assessment that has been conducted – to determine if the proposed mitigative measures were implemented, and to determine the effectiveness of those mitigative measures. It should be noted that the requirements for identifying follow-up differ between jurisdictions.

Follow-up requirements however, may include:

- inspection and surveillance to ensure terms and conditions are implemented;
- compliance or effects monitoring to respectively ensure standards are met and impacts are within the predicted levels;
- impact management to address unanticipated changes and adjust mitigation measures and environmental management plans accordingly; and
- audit and process evaluation measures to examine the accuracy of predictions, the success of mitigation measures, and overall levels of environmental and EA performance.

Presently within EA, health monitoring and follow-up are poorly developed and represents a major area of weakness, particularly in comparison to the attention

and effort that is given to the previous steps. Monitoring and follow-up are perhaps the most crucial steps to advance our understanding of the effects of development projects on our physical and social well-being. If we are to understand the health implications for future development projects, we must rely on an accurate depiction of health effects from similar previous development projects. This can only be obtained through follow-up monitoring.

Step 5: Recommendations Regarding the Project

The final step in an EA is to decide whether or not the project should be allowed to proceed, and if so, what conditions should be attached to the approval. Conditions can include mitigative measures, requirements for follow-up activities, modifications to operating procedures, etc. Requirements for health mitigation or follow-up activities are sector specific (e.g., mining, nuclear, etc.) or project specific (urban/rural setting, or impacting on Aboriginal lands, etc.).

Decisions about whether or not a major project can proceed are made by the Minister of the Environment (provincial), the minister responsible for the project (federal) or Cabinet, and are based on recommendations received from government officials, a board or a panel. At this final stage, the decision-maker(s) look at both the potential adverse environmental and health effects of the project and its anticipated beneficial effects.

Public Participation

An integral part of the EA process is the public consultation process. This crucial stage is not seen as one of the steps of an EA schematic, since it is a parallel or ongoing activity to all of the aforementioned steps.

Environmental issues are best handled with the participation of all concerned citizens. Nations shall facilitate and encourage public awareness and participation by making environmental information widely available.

Rio Declaration on
Environment and
Development, 1992

Public consultation is an important process *throughout* an EA since it allows the public to voice its concerns about issues which it feels are relevant to the proposed project or themselves. In fact, concerns about a project's adverse effects on health, well-being and the quality of life are most often raised within the public consultation process. Allowing different perspectives and views to come forward will hopefully ensure that important aspects are not overlooked. Furthermore, including the public from the onset is important since the public may have valuable knowledge and insights (traditional knowledge) into the ecosystems that will be potentially affected by a project.

Public participation and consultation is a vital component of any EA throughout the entire process. Invariably, the public will be concerned about how the project will impact on its physical and social well-being. As such, it is paramount that consultation between the proponent and the public begin at the scoping stage in order that the public does not feel excluded from the decision-making process. Follow-up activities on health and well-being should also consider the role that the public can play in matters such as follow-up monitoring, advisory committees and notification mechanisms.

Public participation is important in EA for four main reasons:

- it provides an open dialogue among the stakeholders;
- it allows the public to bring forward relevant information about the environmental, health and social conditions in the area;
- it provides a means of gauging public concerns about a project; and
- it can prevent and/or resolve disagreements about the project and its potential effects.

While the proponent or the government might not agree with all public opinions or concerns, it is essential to carefully consider the public's concerns about a project. Without dismissing or criticizing public concerns, proponents and government officials should be prepared to explain carefully and comprehensively the perspectives based on scientific evidence or accepted health practice. For this reason, the role of the health professional can be particularly useful in contributing to the long-term education of the public about the project and about public health matters in general. Health professionals can generally be quite effective at explaining and convincing the public because of their long-standing favourable relationship with the public.

"The fundamental point is that participation without redistribution of power is an empty and frustrating process for the powerless."

Arnstein, 1969

Successful participation will require trust between the proponent and stakeholders and a "level playing field" where all the stakeholders have access to adequate resources and all relevant information and reasonable notice for the public to prepare comments, statements and written responses. Methods and approaches that are used to provide and obtain information from the public can include advertisements on TV or radio, distributing brochures, direct mail, newspapers, and exhibitions or displays in public areas, etc.

Another reason to include the public from the onset is to ensure that they feel that their voices are being heard and considered. This contributes to the "health promotion" concept (discussed in Chapter 1) which contributes to better health for individuals and communities who feel better and can be more receptive or adapt more easily to a project if they are a part of the decision-making process.

Costs of assessing the environmental impacts of projects are on average less than 2% of capital costs and in most instances, represent a fraction of the costs of retrofitting or modifying poorly designed projects.

Health Canada, 1995

Tying Things Together: Health as an Integral Component of EA

Health assessment needs to be integrated into EA for reasons such as: (1) addressing public concerns; (2) minimizing the need for separate health and environmental impact assessments; (3) demonstrating cost effectiveness; (4) minimizing the adverse and maximizing the beneficial effects on health; and (5) supporting the concept of sustainable development. The bottom line is that it makes sense to include health considerations within EA for economic and social reasons and ultimately, to ensure that the health and well-being of individuals and society is not compromised.

Addressing Public Concerns

The public's main concern about projects is frequently related to health, well-being and the quality of life. These issues can go unnoticed by developers and be easily ignored unless individuals or communities raise them. EA has the capacity to address public concerns (and therefore health-related concerns), particularly during the public consultation process. Furthermore, EA has a follow-up and monitoring stage that is designed to ensure that the negative environment and health effects are minimized.

Minimizing the Need for Separate Health Impact Assessments

Health assessment needs to be integrated in EA and not done as a separate entity because decision-makers require information on economic issues, health and environmental effects concurrently. As such, the obvious decision should be to perform all tasks simultaneously. It would be time-consuming and often a duplication of information if one were to assess health separately from EA since information is often common for both. Equally important, the public expects health assessments to be part of the EA process.

Demonstrating Cost Effectiveness

The level of effort for assessing health in EA should be consistent with the magnitude and severity of the potential effects. Assessing health in the EA process is much more cost-effective for the proponent than assessing it separately since there is no duplication of data sets which requires time and additional monetary resources. One might argue that neglecting to assess health in EA would be even more cost-efficient, however, these costs are likely to be very small for the proponent in comparison with the eventual costs on society for curative and treatment services that could be required in the event that health effects were not foreseen or not assessed properly. Adverse effects on health can be minimized or prevented from occurring so as not to be an additional burden on health care services associated with the project. One of the difficulties with this argument is that quantifying the health effects prevented by EA or any positive health outcomes in economic terms is a new and somewhat unknown endeavour.

Minimizing the Adverse and Maximizing the Beneficial Effects on Health

Including health as a component of EA permits the reduction of adverse health effects through mitigative measures. If certain detrimental effects on health have been identified (and cannot be prevented), at the onset of the project, at least these impacts can be mitigated as much as possible and the effects can be monitored closely.

EAs need not only be used to mitigate adverse effects. They also have the potential to maximize beneficial effects of development on health. For example, EAs could identify strategies and measures that will actively promote health such as workplace programs on health. It has already been suggested that EAs should consider how projects can promote health by conducting "health opportunity assessments" (Slooff, 1995).

Contributing to Sustainable Development

In 1987, the World Commission on Environment and Development popularized the term "sustainable development". Since then, many countries have endorsed this concept. The report of the WHO Commission and UNCED's (United Nations Committee on Environment and Development) Agenda 21 recognized that even though health concerns are essentially related to those of environment and development, "health considerations are often taken for granted

Sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

WCED, 1987

when the latter are considered and either ignored or dealt with inadequately". Adamant that this notion must change, the first principle enunciated in the Preamble to the Rio Declaration on Environment and Development thus focuses on human health:

"Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature."

WHO, 1993

Suggested Readings

Arnstein, S. 1969. *A Ladder of Citizen Participation*. American Institute of Planners Journal, July 1969, 216-224.

Canadian Environmental Assessment Act. Bill C-13, June 23, 1992.

Canter, Larry. *Environmental Health Impact Assessment*. Pan American Center for Human Ecology and Health, Pan American Health Organization, WHO, Metepec, Mexico, 1986.

Davies, Katherine and Sadler, Barry. *Environmental Assessment and Health: Perspectives, Approaches and Future Directions*. Minister of Supply and Services Canada, 1997.

Health Canada. *HC Guide to the Canadian Environmental Assessment Act for Health Canada Project Managers*, April 1995.

Sadar, M. Husain. *Environmental Impact Assessment*. 2nd edition. Carleton University Press Inc., Carleton University, Ottawa, Ontario, 1996.

Sadler, Barry. *International Study of the Effectiveness of Environmental Assessment: Final Report*. Canadian Environmental Assessment Agency, Minister of Supply and Services Canada, June 1996.

World Commission on Environment and Development. *Our Common Future*. Oxford University Press. Oxford, U.K., 1987.

World Health Organization. *Health Promotion: A Discussion Paper on the Concept and Principles*. World Health Organization Regional Office for Europe. Copenhagen, Denmark, 1984.

World Health Organization. *WHO Global Strategy for Health and Environment*. Geneva, Switzerland, 1993.

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3

HEALTH INDICATORS FOR USE IN EA

It has already been stated that the assessment phase and the phase determining the significance of potential effects lies at the heart of EA. This Chapter will delve into the requirements for baseline information on health and well-being that will be useful to decision-makers by:

- Discussing the type of health information and indicators for use in EA
- Providing possible sources to contact for information on public and occupational health
- Suggested readings

Health Information and Indicators for Use in EA

As mentioned in the previous Chapter, baseline information on health and well-being is necessary to assess and determine the significance of potential effects on health. Several types of health information are useful:

- scientific information, such as data on the incidence of disease;
- public information and concerns;
- traditional knowledge held by people who live or work on the land, including farmers, hunters, trappers, guides and Indigenous people.

Information on health and well-being is usually represented by indicators. There are many different indicators of health and well-being. In most EAs, existing information and indicators are used for assessment purposes. Occasionally, for large projects, and when there is a shortage of information and indicators, it may be necessary to collect new information and to select new indicators. New information can be collected in health surveys and epidemiological studies, but these are often expensive, time consuming and resource-intensive. It is rarely possible to collect new health information within the timeframe of most EAs.

Information and indicators used for health and well-being should be:

- relevant to the possible effects of the project on health and well-being;
- understandable by all stakeholders;
- interpretable and permit the distinguishing of acceptable from unacceptable conditions; and
- quantitative whenever possible.

The types of information and indicators used in an EA will depend on the type of project and its possible effects. Some types of information and indicators on health and well-being can be found in Table 3.1.

Table 3.1
Types of Health Information and Indicators for Use in EA

	Physical Health	Socio-cultural Well-Being
Public	■ Respiratory effects ■ Noise ■ Effects of accidents and malfunctions ■ Rates of communicable and sexually transmitted diseases ■ Cancer incidence ■ Effects on fertility and development, including congenital anomalies	■ Changes in the quality or way of life ■ Changes in cultural and social patterns ■ Rates of crime ■ Rates of drug and substance abuse ■ Changes in stress levels
Worker	■ Injuries, effects of accidents and malfunctions ■ Days off work or disability days ■ Long term activity limitations ■ Respiratory effects ■ Effects on skin (e.g., irritation, chloracne) ■ Effects on fertility ■ Cancer incidence	■ Changes in the quality or way of life ■ Necessity for relocation ■ Stress-related conditions

The types of information and indicators shown in Table 3.1 are mostly direct measures of health. Monitoring using direct indicators of health will usually only provide information after people have been affected. In contrast, indirect measures can provide an important means of preventive monitoring because they can provide information before health is affected. Indirect indicators of occupational or public health include:

- levels of toxic chemicals in human tissues, including blood, hair and urine;
- biological markers of exposure to toxic chemicals, such as enzyme induction, cellular abnormalities and the formation of DNA adducts;
- the proportion of workers and/or the public following safety procedures (e.g., workers wearing personal protective equipment);
- levels of hazardous substances in the environment;
- effects on the health and well-being of wildlife; and
- discharges of hazardous substances to the environment.

Often, the greatest difficulty lies in measuring and consequently, assessing effects associated with some aspects of physical well-being and socio-cultural well-being. Cumulative effects which contribute to physical well-being are often difficult to assess since effects can, and most likely, will occur over a long period of time. Furthermore, it is difficult to determine whether the impacts are attributed solely to the project on hand or whether other factors in the environment are contributing to the effect. Socio-cultural well-being, however, is much more difficult to assess since changes in the way of life or quality of life are often subtle, occur sporadically over different time spans and affect individuals differently. Consequently, indicators reflecting social well-being as it relates to health in EA are still in the developmental stage.

Contacts for Information on Public and Occupational Health

Fortunately, there is some information and indicators of health and well-being available for workers and the public throughout Canada. Some possible sources of information on public and occupational health are shown in Table 3.2.

Table 3.2
Sources of Information on Public and Occupational Health in Canada

Level	Description of Source
National/ Federal	Canadian census (Statistics Canada)
	Canadian Centre for Health Information (Statistics Canada)
	State of the Environment Report (Environment Canada)
	Federal EAs (Canadian Environmental Assessment Agency)
	Canadian Congenital Anomalies Surveillance System (Health Canada)
	Environmental health assessment staff of Health Canada
	Department of Human Resources
	Environment Canada staff
Provincial	Provincial health surveys (provincial health departments)
	Cancer registries
	Workers' Compensation Boards
	Provincial state of the environment reports (provincial environmental departments)
	Provincial EAs (provincial environmental departments)
	Staff of provincial health, environment and labour departments)
Local	Local health surveys (local health departments)
	Local state of the environment reports (municipalities)
	Health care professionals including physicians, nurses, community workers and industrial hygienists
	Local environmental, public health and occupational health consultants
	The public including local residents, local business people, labour organizations, environmental groups, hunters, fishers, and Aboriginal people
	Local academic and research consultants
	Municipal staff and local health department staff
Others	Epidemiological studies
	Toxicological studies
	Environmental studies

Suggested Readings

McColl, Stephen (ed.) Development of Environmental Health Status Indicators. Institute for Risk Research. University of Waterloo, Waterloo, Ont., Canada, 1992.

4 EA WITHIN A CANADIAN CONTEXT

To gain a better understanding of EA within Canada, the focus of this Chapter will include:

- Progress and achievements in EA
- EA legislation in Canada
- Focusing on health in EA legislation in Canada
- Suggested readings

Progress and Achievements in EA

Pursuing economic development and growth without compromising a sustainable environment has led to the introduction of EA – a decision-making tool designed to help maintain that balance. Today, EA has evolved into an integral element of environmental policy in Canada and elsewhere. As one of the first countries to practice EA and be recognized internationally as a world leader in this field, Canadians have a reason to be proud. Far from suggesting that we should be complacent, the following is an indication of the areas where further progress in EA within Canada is being made.

- The proclamation of the *Canadian Environmental Assessment Act* came into force in January 1995. This Act became significant as it enshrined EA in federal legislation for the first time. More importantly, it became representative of the growing concern for the environment and demonstrated government's recognition of the stature of the EA process as an effective means to integrate economic growth and sustainable development into decision-making. At this time, the Canadian Environmental Assessment Agency was established to administer the Act. All provinces in Canada currently have legislated requirements for EA of projects as well.

The concern that Canadians have about environmental issues continues to be expressed in terms of personal health, the health of one's family, and the health of future generations.

We know that the quality of life depends on a clean and healthy environment.

We also know that our health is primarily our own responsibility and that we can protect ourselves from most hazards. To do so, however, we need accurate, timely and appropriate information.

"Notable achievements have been made in integrating environmental considerations into economic and sectoral policies. Examples include the legislated environmental assessment process, (and) the environmental analysis of policy proposals and legislation."

OECD Environmental
Performance Reviews:
Canada, 1995

- The integration of environmental considerations into proposed policies, programs and plans is emerging more frequently at all levels of government. In fact, the position of a Commissioner of Environment and Sustainable Development was established under the *Auditor General's Act*. Amendments to this Act required federal departments to prepare sustainable development strategies for submission to Parliament in December 1997, with annual reporting of departments' progress thereafter.
- In January 1994, the North American Free Trade Agreement (NAFTA) entered into force between Canada, the U.S. and Mexico. This Agreement represents a milestone for environmental protection as it is among the first to address environmental issues within a trade agreement. The North American Commission on Environmental Cooperation was established to protect, conserve and enhance the environment by monitoring

and reporting on the environmental impacts of the NAFTA. All three countries require foreign companies to adhere to their countries' EA procedures.

Environmental Assessment Legislation in Canada

Each jurisdiction in Canada has different EA legislation and requirements. For example, unlike most other EA processes in Canada, federal EAs are based on the principle of self-assessment. In other words, the federal department responsible for a project is also responsible for the preparation of the EA. In contrast, provincial legislation usually states that the Minister of the Environment is responsible for making decisions about the EA, rather than the minister responsible for the project. The provincial and federal legislative requirements for including health in EA in Canada are highlighted in Table 4.2.

In most Canadian jurisdictions (municipal, provincial, federal), EA provides information for making decisions about whether or not projects should be supported or permitted to proceed. In other words, EA is usually an aid to decision-making, rather than an approval process for projects. One exception to this is Ontario, where EA can be a decision-making process.

In Canada, all three levels of government share responsibility for health although constitutionally, health is primarily a provincial responsibility. Municipal or local health departments are often responsible for routine services, such as ensuring food, hygiene, water sampling and responding to complaints. Provincial environment and health ministries are involved in a wide range of issues, including environmental monitoring, risk assessment, setting standards, guidelines and objectives, and planning and approvals. The federal government is active in establishing guidelines for environmental health. It is important for EA professionals to be aware of the responsibilities of different levels of government and to consult with health and labour ministry staff at different levels of government, since responsibility for environmental, occupational and public health is shared.

Subject to the scope of the relevant statutes, proponents of projects must carry out an environmental assessment under federal and/or provincial legislation, depending on whose jurisdiction the project and effects occur. The *Canadian Environmental Assessment Act* (1995) is the main governing piece of legislation to be followed under the federal process. In addition, there are EA requirements found in other federal statutes attached to the issuance of certain permits or licenses or in self-government and land claims settlement agreements with First Nations. All Canadian provinces and territories, however, also have their own distinct legal procedures and requirements. That is why some projects require authorization from both the federal and provincial or territorial government. For this reason, EA practitioners should bear in mind which EA process must be followed.

Although the procedures among the provinces (and the federal process) are comparable, each system has a unique perspective on how EA should be carried out within its jurisdiction. Table 4.1 offers some of the similarities and differences among the federal and provincial EA systems.

Table 4.1
Overview of Environmental Assessment in Canada

	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld	NWT	YT	Canada (CEAA)
<i>EA Act</i>												x	
EA Planning Process and Impact Assessment					0	0	0		0			0	0
Broad Definition of EA			0				0		0	0	x		0
Public and Private Sector					0							0	
Scope of Act		0	0	0		0			0	0	x	x	0
Size of Projects	0x	0x		0		0	0	0		0		x	
Policy Level EA	x	x	x	x	x	x	x		x		x	x	x
Cumulative Effects			0	0	x	0	0	x	0	x	x	x	
Alternatives	0	0	0	0		0	0	0			x	x	
Approvals Granted										0	0	0	0
Provisions for Exemptions	0	x	x		x	0		x	0	x	0	x	0
Public Involvement			0		0				0		x	0	
Review of EAs									0			0	
Authority of Review Panel or Board	x		x	x		x	x	x	x	x	x	x	x
Formality of Panel or Board	0x					0	0	0	0	0	0	x	0
Intervenor Funding for Panel or Board Process		0	x	0	0	x	x	x	x	x	x	x	
Participant Funding Early in Planning Process	0	x	x		x	x	x	x	x	x	x	x	0
Conflict Resolution Provisions	0		0	0	0	0	x	x	x	x	x	x	

Compiled by: EA Branch, MOEE, Ontario from survey of jurisdictions.
Prepared: September 1994

Explanations and symbols for this table can be found on the following page.

Explanation for Table 4.1

<i>EA Act</i>	Legislated
	o Policy or Guideline
	x No formal legal instrument
<i>EA as Planning Process and Impact Assessment</i>	EA is Impact Assessment
	o EA is a Planning Process and Impact Assessment
<i>Broad Definition of Environment</i>	Biophysical, socio-economic and technical; direct and indirect
	o Biophysical and related socio-economic effects
	x Biophysical only
<i>Public and Private Sector</i>	Public and Private Sector
	o Public Sector and Selected Private Sector
	x Public Sector
<i>Scope of Act/Policy</i>	Projects, Activities, Programs, Plans
	o Projects, Activities
	x Projects only
<i>Size of Projects</i>	Major and minor impacts and large and small projects
	o Specific lists of projects
	x Major projects or as determined by Minister
<i>Policy Level EA</i>	Included in legislation
	x Not included
<i>Cumulative Effects</i>	Explicit requirement in Act or Regulation
	o Implied or guideline basis
	x Not required
<i>Alternatives</i>	Explicit requirement to examine functionally different alternatives to the project, e.g., rail vs road vs air
	o Explicit requirement to examine different alternative methods of implementing project, e.g., sites or designs
	x Examine project only
<i>Approvals Granted</i>	Formal approval, licence or permit issued for EA with explicit conditions
	o Specialist advice to other agencies to issue their approvals
	x No formal or informal approval granted
<i>Provision for Exemptions</i>	No provisions for exemptions
	o Exemptions based on defined thresholds or criteria
	x Discretionary exemptions granted by government
<i>Public Involvement</i>	Statutory requirement in Act or Regulation
	o Voluntary and suggested in guidelines
	x No explicit requirement

Explanation for Table 4.1 (cont'd)

	Provisions for independent review by panel or board
Review of EAs	o In-house review
	x No provision
Authority of Review Panel or Board	Decision-making
	x Recommendation only
Formality of Panel or Board	Judicial or quasi-judicial adversarial
	o Formal but not judicial
	x Informal
Intervenor Funding for Panel or Board Process	Government pays
	o Proponent pays
	x No formal funding
Participant Funding Early in Planning Process	Explicit statutory requirement
	o Voluntary, encouraged by guidelines
	x No requirement
Conflict Resolution Provisions	Mediation or Alternative Dispute Resolution (ADR) offered as an alternative to review by board, agency or panel
	o Mediation or ADR offered throughout the EA Process
	x Conflict resolution not offered

Compiled by: EA Branch, MOEE, Ontario from survey of jurisdictions in *Environmental Assessment in Canada: Frameworks, Procedures, and Attributes of Effectiveness*. Minister of Supply and Services Canada, 1996.

On rare occasion, projects can trigger both federal and/or provincial EAs. Governments recognize the complexity and potential for duplication of having to comply with provincial, and municipal requirements concurrently. For this reason, federal and provincial governments are working to harmonize their EA processes. To date, harmonization agreements have been reached between the federal government and two provinces, Alberta and Manitoba. An agreement in principle with British Columbia has been established and other provinces are quickly following suite. These agreements acknowledge that cooperative approaches between the two levels of government are the most appropriate measures to take to ensure effective and efficient processes.

Health Within EA Legislation in Canada

Including health in EA in Canada has been recognized by the provinces under different legislative acts and requirements. Table 4.2 summarizes the current requirements for including health and well-being in EA in major Canadian jurisdictions (Health Canada, 1994).

Table 4.2
Requirements for Including Health in EA in Canada (1994)

Jurisdiction	EA Legislation	Status
British Columbia	<i>Environmental Assessment Act</i>	Health is mentioned in several places. "Effects" are defined as including health and the purpose of the Act includes the assessment of "health effects".
Alberta	<i>Alberta Environmental Protection and Enhancement Act</i>	Health is included in the definition of an "adverse effect" and the definition of "environment" includes "all living organisms" which covers human life.
	<i>Alberta Public Health Act</i>	Requires municipal health departments to assess the health and environmental effects of proposed waste facilities.
Saskatchewan	<i>Environmental Assessment Act</i>	Health is included in the definitions of "contaminant" and "pollution".
Manitoba	<i>Environment Act</i>	Health is included in several definitions, including "development", "pollutant" and "environmental health".
Ontario	<i>Environmental Assessment Act</i>	The definition of "environment" includes human life.
Quebec	<i>Environmental Quality Act</i>	Section 20 states that nothing may be discharged into the environment that "is likely to affect the life, health, safety, welfare or comfort of human beings".
New Brunswick	<i>Clean Environment Act</i>	Human life is included in the definition of "environment".
Nova Scotia	<i>Nova Scotia Environmental Assessment Act</i>	The definition of "environment" includes a reference to human life.

Table 4.2 (cont'd)

Jurisdiction	EA Legislation	Status
Newfoundland	<i>Environmental Assessment Act</i>	The definition of "environment" includes "human life" and "the social, economic, recreational, cultural and aesthetic conditions and factors that influence the life of humans in a community".
Prince Edward Island	<i>PEI Environmental Protection Act</i>	"Environment" is defined as including human life.
Northwest Territories	<i>Canadian Environmental Assessment Act</i>	See below.
Yukon Territory	<i>Umbrella Final Agreement of Land Claims Agreement</i>	A development assessment process is currently being developed.
	<i>Canadian Environmental Assessment Act</i>	See below.
Federal Government	<i>Canadian Environmental Assessment Act</i>	The definition of an "environmental effect" includes any change in health or socio-economic conditions that are caused by the project's environmental effects.

One health area of federal jurisdiction is Aboriginal health. Chapter 5 will discuss the unique situation of Aboriginal people within the Canadian Constitution and the role of Aboriginal people in EA.

Suggested Readings

Canadian Environmental Assessment Agency in Collaboration with Environment Canada. *Environmental Assessment in Canada: Achievements, Challenges and Directions*. Minister of Supply and Services Canada, 1996.

Doyle, Derek and Sadler, Barry for CEAA and UMA Engineering Ltd. *Environmental Assessment in Canada: Frameworks, Procedures and Attributes of Effectiveness*. Minister of Supply and Services Canada, 1996.

Organization for Economic Cooperation and Development, *OECD Environmental Performance Reviews: Canada*. ISBN 92-64-14546-X, October, 1995.

5 ABORIGINAL HEALTH AND TRADITIONAL KNOWLEDGE

Aboriginal people occupy a unique place in Canadian society; culturally, historically, geographically and legally. In order to understand the responsibilities of those conducting EAs to Aboriginal people and the possible roles of Aboriginal people in EAs, this Chapter will discuss:

- Who are Indigenous people?
- Aboriginal definition of health
- Health impacts on Aboriginal communities
- Aboriginal interests in land – reserves and traditional territories
- EA legislation
- Fiduciary duty
- Federal or provincial responsibility?
- Traditional knowledge and its origins
- What is traditional knowledge
- Health and traditional knowledge
- Using traditional and western knowledge together
- Future prospects for including traditional knowledge in health
- Suggested readings

Who are Indigenous People?

Before discussing Aboriginal health and the role of Aboriginals in the EA process, it is necessary to define who are Indigenous people. According to the International Labour Organization, there are about 5,000 different Indigenous or tribal peoples living in seventy countries. The total world population of Indigenous and tribal people is estimated at about 300 million, mostly in Asia. In Canada, Indigenous peoples include Indians, Inuit and Métis. These peoples are collectively referred to as Aboriginal.

The term "First Nations" is often used by Aboriginals to refer to "Indians". The term Aboriginal and Indigenous are synonymous.

Aboriginal Definition of Health

Aboriginal people have traditionally gone further in their holistic view of health than even the World Health Organization's comprehensive definition which was discussed in Chapter 1. However, all Aboriginal communities probably do not share the same definition of health. Equally important, there can be significant social and cultural differences among the different communities. The definition of health by the First Nations of British Columbia is but one among a multitude of definitions offered by Aboriginal groups and states:

Health

"obtaining and maintaining a balance of all aspects of the self – mental, emotional, spiritual and physical – with and through the help and involvement of the family and the community"

First Nations of British Columbia

This broad definition not only illustrates the interconnection between all aspects of a person's life, and the effect that a problem in one area can have on the others; it also shows the great value that Aboriginal people place on the community. For many, this sense of attachment to the community is as close as family, and the sense of attachment to the land goes far beyond any individualized concept of ownership. The people, the elements, the plants and the animals are all interconnected, on the physical and spiritual planes.

Health Impacts on Aboriginal Communities

Many development projects may have a major impact on the environment of Aboriginal communities, especially those located downstream or downwind of the project. Air- and water-borne contaminants may be carried into the community, and can pose serious health risks to the inhabitants. Also, the greater the reliance of community members on wild food such as game and fish, the higher the health risk, as the animals also ingest the contaminants and pass them on in higher doses when used for human consumption. In this way, Aboriginal communities experience a potentially far greater health impact than other communities, in the same geographic area, that do not rely on wild food. The impact of the projects on the environment and the consequent loss of fish and wildlife also negatively impact on the possibility for Aboriginal people to pursue their traditional lifestyles, and to pass these on to future generations.

Aboriginal communities that may be directly affected by a project should be involved from the outset in the EA conducted for that project (whether or not the EA is triggered or conducted under a federal or provincial EA process). Their close connection to and additional reliance on the natural environment makes Aboriginal people especially concerned with the healthy preservation of that environment, which in turn, increases the possibility of negative health effects of a project on Aboriginal individuals and communities.

It is therefore necessary for all levels of government to develop specific processes, within or in addition to their regular public consultation procedures, to fully inform and involve local Aboriginal communities that could experience negative environmental impacts of projects.

Aboriginal Interests in Land

There are two broad types of Aboriginal interests in land - reserve lands and traditional territories - each of which need to be addressed in the EA process.

In the provinces, reserves are areas that have been set aside for the exclusive "use and benefit of Indians" under the *Indian Act*. They are run by Band Councils elected by members of the community, and are officially considered to be federal lands as these lands are owned by the federal government. Individual Aboriginal people belonging to a band which has a reserve often have exclusive possession of allotments on the reserve. Band Councils administer the rest of the reserve. All land transactions on reserve are effected exclusively by the federal government, usually at the request of the Band Council or an individual band member. Band Councils and band members who have allotments, may ask the federal government to sell, lease or otherwise dispose of their interests. Band Councils usually do so with the consent of the community and by first surrendering or designating the land to the federal government. The government sometimes negotiates the transaction on behalf of the Band.

Traditional territories are much larger land areas, often encompassing thousands of hectares, where Aboriginal communities have historically carried out a range of traditional activities. These lands are used for subsistence activities such as hunting, trapping, fishing and other resource harvesting, but they also serve vital social, medical and spiritual needs and may contain sacred sites and burial grounds.

EA on Reserves

The *Canadian Environmental Assessment Act* (CEAA), which came into effect in 1995, requires that projects having environmental impact, and that are to be carried out wholly or partially on an Indian reserve be subject to an EA as outlined under regulation. However, in the current era of increasing self-government by Aboriginal people, it is not appropriate for government to impose its process on First Nations governments without their participation. CEAA allows for the development of regulations regarding EA on reserves, and the federal and Aboriginal governments are currently discussing whether such regulations should be developed, and if so by whom, or whether First Nations should develop and implement their own EA processes.

Until such time as these issues are resolved, an Interim Measures Agreement is being developed. The Interim Measures Agreement, once in place, will apply when the federal government involvement with a project is limited to funding only. In the absence of the Indian Lands and Funding Regulations, to be developed under CEAA, the federal government and First Nations have no legal obligations to undertake EAs thus creating a gap in the legislation. The other CEAA triggers (proponent, Law List, land management) are presently administered by the federal government.

EA for Projects on Traditional Territories

Throughout Canada, some territories are currently the subject of land claims by various groups of Aboriginal people, based on their historical and on-going use of those lands for traditional purposes. Only a few of these claims over traditional territories have been accepted by the federal government for negotiation. Aboriginal people also present these claims as a basis to respond to the needs of Aboriginal communities, since if they are going to achieve any meaningful degree of self-government, they require control of a land base that will support – physically and economically – their growing populations. Negotiations are under way involving First Nations, federal and provincial governments to resolve these claims and come up with an equitable distribution of not only the land, but also the rights to the resources on and under that land, and the appropriate management of both lands and resources.

Often projects undergoing an EA are also situated within traditional Aboriginal territories, which are the subject of land claim negotiations. Aboriginal people may be concerned that their rights are being prejudiced by developments on these lands before the claims are settled.

EA Legislation

Under the *Canadian Environmental Assessment Act* (CEAA), there are three levels of EA for projects that fall under its jurisdiction: screening, comprehensive study and mediation or assessment by a review panel. In any case, the following factors must be included: environmental effects of a project and their significance must be assessed, relevant comments from the public, and mitigation measures. "Environment" is defined extremely broadly in the CEAA to include "land, water and air... all living organisms, and... interacting natural systems." "Environmental effect" is defined in part as:

"any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by Aboriginal persons, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance."

The federal role is Aboriginal-specific; the provincial role is based on equity to all residents. Both are, however, subject to the demands of the honour of the Crown, and this must mean, at a minimum, that the Aboriginal people to whom the Crown in all its emanations owes an obligation of protection and development, must not lose the benefit of the obligation because of federal-provincial jurisdictional uncertainty.

Pratt, 1989

"Environment" means the components of the earth and includes:

- (a) land, water and air, including all layers of the atmosphere,
- (b) all organic and inorganic matter and living organisms,
- (c) the social, economic, recreational, cultural, spiritual, and aesthetic conditions and factors that influence the life of humans and communities, and
- (d) a part or combination of those things referred to in (a) and (c) and the interrelationships between two or more of them.

Innu Nation, 1996
Voisey's Bay, MOU

Clearly, the federal government has bound itself to ensure that the broad range of Aboriginal people's interests are adequately taken into account. While no such Aboriginal-specific provisions exist in provincial EA legislation, the requirements for public consultation and assessment of health effects are similar, and include Aboriginal people implicitly as part of the provincial population.

Fiduciary Duty

Fiduciary duty is variously defined, and the interpretation of the scope of the duty varies even more widely. In general, where one has control over the interest of another arising from a trust, the first person has a general duty to act primarily in the interest of the other party. Canadian courts have recognized that certain specific fiduciary duties may apply to the Crown in certain circumstances.

The *Guerin* Case – Reserve Lands

This 1984 case involved the lease of reserve land to a non-Indian party. The federal government obtained the land surrender on the understanding that certain terms would be included in the lease, but proceeded to negotiate a lease that was far less favourable to the band than the one they had agreed to on surrender. The band sued the government and the case went to the Supreme Court of Canada.

The Court recognized that the Aboriginal interest in land predates contact with Europeans, and characterized the duty of the federal government to Aboriginal people as fiduciary in regard to land holdings.

The Indians' interest in land is an independent legal interest. It is not a creation of either the legislative or executive branches of government... Where by statute, agreement or perhaps by unilateral undertaking, one party has an obligation to act for the benefit of another, and that obligation carries with it a discretionary power, the party thus empowered becomes a fiduciary. Equity will then supervise that relationship by holding him to the fiduciary's strict standard of conduct.

Because federal government intervention is necessary under the Indian Act for the band to comply in a transaction involving reserve or surrendered land, the government is therefore required to act in the best interest of the band.

The *Sparrow* Case – Aboriginal Rights

The 1990 Supreme Court decision in *Sparrow v. the Queen* extended the scope of the fiduciary relationship far beyond reserve land and elaborated it to include protection of Aboriginal rights as recognized and affirmed by section 35 of the

Constitution. Any legislative infringement on existing Aboriginal rights must be justified by the Crown; the government must show that a valid legislative objective exists which is consistent with the fiduciary relationship between it and Aboriginal people, and that Aboriginal rights are only infringed to the extent necessary to meet that objective.

This does not protect Aboriginal rights absolutely, but does give them a very high degree of protection. For example, where fishing is at issue, the only justification for infringement of the Aboriginal right to fish (for food, social and ceremonial purposes) was identified as species conservation. The interests of all other users of the resource are subordinate to the Aboriginal right, and it is the duty of the federal government to protect that right.

Federal or Provincial Responsibility?

Whether the provincial governments are themselves legally obliged to act in the interests of Aboriginal people, beyond their responsibilities to every resident of the province, is a question still subject to great debate.

Where by agreement a provincial government is conducting a federally triggered EA using the province's own process, the federal government should ensure that Aboriginal people are appropriately involved, and that assessment is made of all factors that are required to be considered by CEAA. These include the possible effects of a project on Aboriginal people's immediate and future health and well-being, and on their ability to pursue aspects of a traditional lifestyle. Adequate public consultation must take place since each Aboriginal group is culturally and socially distinct and it cannot be assumed that the interests of and impacts on one Aboriginal group are representative of all Aboriginal groups.

Where Aboriginals could be potentially affected by a project, the use of EA processes may assist in assessing the impact on Aboriginal interest, where such exist and where there may be a fiduciary duty. Furthermore, including Aboriginal people in the EA process, from the outset of the process, could reduce costs to proponents which are incurred by having to redo large sections of study reports, and conduct whole new studies, when the effects of the project on Aboriginal communities have not been initially or adequately considered. There is, however, a more fundamental reason for seeking the input of Aboriginal people. Aboriginal people are able to bring their unique perspective on environmental protection and sustainable use of resources to the EA. This is what is commonly referred to as 'traditional knowledge'.

Traditional Knowledge and Its Origins

All cultures have knowledge vested in their traditions. It can be as simple as a recipe handed down through generations, or a way of thinking about the world. It can be as formal as a traditional song or story, or it can be as informal as a manner in which people carry out a routine task. Typically, the farmer's understanding of the plants and soil, the fisherman's insight of the water and marine ecosystem, or the hunter's perception of animal practices are but a handful of sources of traditional knowledge.

One of the most well documented groups which have significantly contributed to the concept of traditional knowledge are Indigenous peoples. Indigenous peoples often do not have formal written databases of knowledge. Some capture the knowledge in imagery, such as the ancient wall paintings in France, or in Australia, or of the North American Indians. Most have traditional songs, stories, legends, dreams, methods, and practices. Sometimes it is preserved in the form of memory games, initiation rites, ceremonies, or dance. Occasionally it is preserved in artifacts handed from father to son, or mother to daughter.

Where the Indigenous peoples themselves have disappeared – such as in the case of the Lescault rock paintings, the knowledge is gone as well. Currently within Indigenous communities, competition from European-derived cultures can capture the imagination of the young, teach them in western ways, and limit the capacity of the elders to pass on traditional knowledge to the young.

What Is Traditional Knowledge?

Traditional knowledge is shaped by the mythology of the people with the knowledge. For example, in European-derived culture, the Judeo-Christian mythology begins with an assumption that the world was created by God in six days and that God had the form of a man giving man dominion over nature. The legend of the Garden of Eden separated humankind and the natural world allowing people to make observations of nature from afar – from an objective viewpoint.

The following descriptions of the characteristics of Indigenous traditional knowledge are the result of a workshop on environmental assessment held in Inuvik in November 1995 (Circumpolar Aboriginal People and Co-management Practice, November 20-24, 1995, Coordinated by the Inuvialuit Joint Secretariat). These are the words of Inuit people answering the question, "What do we mean by traditional knowledge?"

- "It is practical common sense based on teachings and experience passed on from generation to generation."
- "It is knowing the country; it covers knowledge of the environment (snow, ice, weather, resources), and the relationship between things."
- "It is holistic – it cannot be compartmentalized and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture and language of the people. It is a way of life."
- "Traditional knowledge is an authority system. It sets out the rules governing the use of resources – respect; an obligation to share. It is dynamic, cumulative and stable. It is truth."
- "Traditional knowledge is a way of life – wisdom is using knowledge in good ways. It is using the heart and the head together. It comes from the spirit in order to survive."
- "It gives credibility to the people."

The Words of the Director General of UNESCO (Mayor, 1994)

The Indigenous peoples of the world possess an immense knowledge of their environments, based on centuries of living closer to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. In rural communities in developing countries, locally occurring species are relied on for many – sometimes all – foods, medicines, fuel, building materials and other products. Equally, peoples' knowledge and perceptions of the environment, and their relationships with it, are often important elements of cultural identity.

Recognition of Traditional Knowledge

Although the recognition of traditional knowledge as having any validity or value has been slow in western societies, it is now beginning to gain credibility. Western traditional knowledge provided the basis for much of western medicine, centuries of herbalist knowledge accumulated in the early writings of travellers, clerics, and natural historians.

Acceptance of the idea that ecological knowledge (a recent concept in science – starting about 1930), has existed in traditional knowledge for thousands of years is only a few years old. The Brundtland Commission in 1987 was the first to offer some credence to the concept. Very recently, the Biodiversity Convention, Agenda 21, the Rio Declaration and Forest principles provided a contemporary context for traditional knowledge.

The Content of Traditional Knowledge

Traditional knowledge is a system of knowledge. While it is not possible to disassemble the knowledge in the same manner that science can be parsed, nonetheless, there are categories that parallel science within the traditional knowledge base.

Classification: the understanding of specific elements of factors in the environment, such as the plants, animals, soil, water, air, weather and environmental phenomena;

Technology and Resource Management: the development and use of traditional technology for farming, hunting, forestry, fishing, trapping, and managing the resources for the use of both current and more importantly, future generations.

Ecology, Evolution, and Systematics: the understanding and awareness of the "web of life". This includes the concept of origins of interrelatedness of types of animals, plants, and rocks. It understands the dynamic interrelationships of current ecological members of the same areas.

This last element of traditional knowledge is the most powerful, but also the least addressable from a scientific point of view. The basis for the traditional understanding assumes a holistic view including language, culture, practice, spirituality, mythology, customs, and even the social organization of the local communities. Scientific practice excludes the humanistic perspective, although it includes humans as animals.

Around the world, there is a sense of urgency to "collect" traditional knowledge because as the elders die, so the knowledge dies with them. The parts of the traditional knowledge base that are currently being collected most actively are both the classification and the technological aspects. Databases of many types are springing up, and some are available outside the traditional communities. There are inherent problems in making use of this knowledge – it is missing the contextual elements derived from the holistic and very personal approach that characterizes traditional use of the knowledge.

One of the problems with collecting the information in this manner, and missing the contextual elements is that the temptation is to compare scientific and traditional answers. For example, the Inuit people have a far richer and more subtle understanding of the characteristics of ice and snow than does science. In fact, some of the Inuit classification is accessible only by virtue of its relationship to human activities and feelings. In South America, some of the Indian tribes have

a classification system for trees that identifies many species that science does not, and appears to miss obvious species that science recognizes. Once again the classification systems have a different set of assumptions, so are not directly comparable. The species that appear to have been missed turn up as recognizable in other contexts for the native people. The extras from a scientific perspective are identified by traditional people either because science simply missed them, or because ecological variants have equal importance to genetic species from a traditional standpoint. These comparisons also sometimes incorrectly lead western practitioners to trivialize the traditional understanding because they do not have the whole concept included in the cultural and other values of traditional knowledge.

Health and Traditional Knowledge

Within an Indigenous community, there is a sharing of the knowledge base (as compared to hunting and fishing which are basically the domain of the male) between the sexes. Males tend to have dominion over the larger and more abstract issues of health, and the traumatic treatments. Women, by contrast, are the keepers of the practical remedies for common maladies, and also of much of the knowledge of pharmaceuticals and herbal remedies.

In the Declaration On The Rights of Indigenous Peoples in 1994, Article 24 stated that Indigenous peoples have the right to their traditional medicines and health practices, including the right to the protection of vital medicinal plants, animals, and minerals. The declaration further claims the requirement of States to respect Indigenous medicine, pharmacology, health practices and promotion, including preventive and rehabilitative practices (section 3, article XII on health and well-being).

On the Matter of Ownership of Traditional Knowledge

Each local community considers its knowledge to be owned by that community. There is also a sense of common ownership when the knowledge of one local community is also the knowledge of another community. It is regarded as intellectual property, much as the written word or an artistic expression in the form of a painting, poem, or film is regarded as intellectual property.

Indigenous people have shared this knowledge freely in the past and have rarely received proper compensation or recognition for it. Today, Indigenous people feel the keepers of the knowledge who share it should be compensated – just like any other professional – for doing so.

Table 5.1
Comparisons Between Traditional and Western Scientific Knowledge Styles

Indigenous Knowledge	Western Scientific Knowledge
Assumed to be the truth	Assumed to be a best approximation
Sacred and secular together	Secular only
Teaching through story-telling	Didactic
Learning by doing and experiencing	Learning by formal education
Oral or visual	Written
Integrated – based on whole systems	Analytical – based on subsets of the whole
Intuitive	Model or hypothesis-based
Holistic	Reductionist
Subjective	Objective
Experiential	Positivist

Table 5.2
Comparisons Between Traditional and Western Scientific Knowledge In Use

Indigenous Knowledge	Western Scientific Knowledge
Lengthy acquisition	Rapid acquisition
Long-term wisdom	Short-term prediction
Powerful predictability in local areas	Powerful predictability in natural principles
Weak in predictive principles in distant areas	Weak in local areas of knowledge
Models based on cycles	Linear modelling as first approximation
Explanations based on examples, anecdotes, and parables	Explanations based on hypotheses, theories, laws
Classification ■ mix of ecological and useful application ■ non-hierarchical differentiation ■ includes everything natural and supernatural	Classification ■ based on phylogenetic relationships ■ hierarchical differentiation ■ excludes supernatural

Using Traditional and Western Knowledge Together

In recent years, there has been an increasing acceptance, if tentative, of Indigenous knowledge in many fields. But there is both danger and benefit in these first communications.

Romanticism of Indigenous sacred beliefs, natural resource management, and health care can be very destructive and even dangerous. Often these are exploited with no care for the consequences of misusing these knowledge bases. Practitioners investigating these areas should always be aware of the existence of charlatans. In fact, more than one elder has told of tiring of the constant and seemingly silly questions of anthropologists. Indigenous people also became jaded because they came to realize the information they passed on never benefited the community that owned it, and they never received copies of the results of the studies. To amuse themselves, the elders sometimes made up inane and false "Aboriginal" knowledge, knowing that the professors would never know the difference.

By contrast, when Indigenous knowledge is used in its original context, and in partnership with western knowledge, the combination is often much more powerful a tool than either used alone. The most important examples of this are to be found in resource management, where both scientists and Aboriginal hunters, trappers, or fishermen work together giving equal weight to both types of knowledge. The practice of co-management was pioneered and is currently being developed most effectively in Canada. It is not, however, an easy process – it requires a hands-off style of governing the actions of the on-the-ground members of the co-management team. Often the information base is not easily written down, and if bureaucracy interferes too much, or if too sceptical members are chosen from the western side, the intimate relationship and trust amongst the members is lost, and the process of co-management can fail.

Co-management does exist to a certain extent in the health field. One example is the official recognition of the contribution of Aboriginal medical interpreters who act as cultural brokers, mediators, translators, stress-relievers, health care service dispatchers, etc. Without their input and guidance, many patients would be at a loss in the western medical system. Nonetheless, much work remains to integrate western and indigenous knowledge. What is needed is a true and trusting partnership, rather than the usual attitude of testing to see if the efficacy of traditional knowledge can be disproved. Modern medicine is also rapidly broadening its viewpoint from being a practice of health care to a practice of ensuring well-being. This changing perspective matches the attitudes of many Indigenous practices.

Future Prospects for Including Traditional Knowledge in Health

To create such a partnership will require research to assemble and examine case-studies with the cooperation of Indigenous peoples. Once the required comfort level is reached, role-playing in the format of training workshops in documented case studies would enlighten the practitioners on both sides. Just as in the development of co-management of natural resources, the development of acceptable medical protocols would take time. This is not to say that progress has not been achieved in the integration of western and Aboriginal health systems. Indeed, many users are integrating practices from both approaches despite a lack of official recognition by the medical community. For example, some people seek alternative medical help to see who will provide better support whereas others try to maximize the benefit by combining both approaches. However, if similar increased effectiveness were achieved in medical care to what has been achieved in natural resource management, it could represent a remarkable improvement and lowering of costs.

Suggested Readings

- Armason, T., Hebda, R.J., and T. Johns. Use of Plants for Food and Medicine by the Native Peoples of Eastern Canada, 1981.
- Berkes, F. Traditional Ecological Knowledge in Perspective. University of Manitoba, Winnipeg, Manitoba.
- Berkes, Fikret, P. George, R. Preston and J. Turner. The Cree View of Land and Resources: Indigenous Ecological Knowledge. TASO Report, Second Series No. 8, 1992.
- Bodeker, G. Traditional Knowledge into the Twenty-First Century: Traditional Health, Knowledge and Public Policy. *Nature and Resources* 30(2): 5-16, 1994.
- Booth, A.L. and H.L. Jacobs. Ties that Bind: Native American Beliefs as Foundation for Environmental Consciousness. *Environmental Ethics* 12(1): 27-43, 1990.
- DeFaveri, I. Contemporary Ecology and Traditional Native Thought. *Canadian Journal of Native Education* 12(1): 1-9, 1984.

Department of Justice Canada. "Fiduciary obligation of the Crown towards Aboriginal peoples: implications for federal managers", in *Justice Echo*, No. 11, June 1991.

Environment Law and Policy, [June or July issue] 1996, Carswell Publications.

Harp, W. Ecology and Cosmology: Rain Forest Exploitation Among the Embera-Choco. *Nature and Resources* 30(1): 23-27, 1994.

Hughes, J.D. Forest Indians: The Holy Occupation. *Environmental Review*.

Inglis, J.T. (ed.) Traditional Ecological Knowledge: Concepts and Cases. International Program on Traditional Ecological Knowledge and International Development Research Center. Ottawa, 1993.

Interdepartmental Working Group to the Committee of Deputy Ministers on Justice and Legal Affairs. *Fiduciary Relationship of the Crown with Aboriginal Peoples: Implementation and Management Issues – A Guide for Managers*, Government of Canada, October 1995. This report contains an analysis of the duties owed from a governmental management and implementation perspective. Of particular interest to those responsible for conducting EAs will be the statements of principles to be followed in dealings with Aboriginal people:

Annex I: General Principles of Consultation for Fulfilment of Specific Legal Duties of a Fiduciary Nature;

Annex II: Principles for Prudent Management of Aboriginal Lands and Resource Interests Held by the Crown; and

Annex III: Principles for Actions Affecting Section 35 Aboriginal and Treaty Rights.

Johnson, Darlene M. "A Theory of Crown Trust Towards Aboriginal Peoples", *Ottawa Law Review*, Vol. 18, No. 2, 1986.

Johnson, M. Research on Traditional Environmental Knowledge: Its Development and Its Role. Dene Cultural Institute. NWT.

Linden, E. Lost Tribes, Lost Knowledge: When Native Cultures Disappear, So Does a Trove of Scientific and Medical Wisdom. *Time*, September 23, 1991.

Martin, G.J. and A. Semple. Traditional Knowledge in Tropical Environments: Joint Ventures in Applied Ethnobotany. *Nature and Resources* 30(1): 5-17, 1994.

Marc, Magali. "Paying the Environmental Bill: The Environmental Deficit and its Effects on Human Rights and the Rights of Communities", in Ryszard I. Cholewinski, ed., *Human Rights in Canada: Into the 1990s and Beyond*, Human Rights Research and Education Centre, University of Ottawa, 1990, p 183.

Morse, Bradford. "Government Obligations, Aboriginal Peoples and Section 91(24) of the *Constitution Act, 1867*", in David C. Hawkes, ed., *Aboriginal Peoples and Government Responsibilities*, Ottawa: Carleton University Press, 1989, p 59.

Ontario Ministry of Health, *New Directions: Aboriginal Health Policy for Ontario*, Queen's Printer for Ontario, 1994.

Owen, David P. "Fiduciary Obligations and Aboriginal Peoples: Devolution in Action", [1994] 3 *Canadian Native Law Reporter*, p 1.

Pratt, Alan. "Federalism in the Era of Aboriginal Self-Government", in David C. Hawkes, ed., *Aboriginal Peoples and Government Responsibilities*, Ottawa: Carleton University Press, 1989.

Streather, A. *Traditional Ecological Knowledge. A Sourcebook*, 1992.

Thomas, G. *Traditional Knowledge into the Twenty-First Century: Traditional Ecological Knowledge and the Promise of Emerging Information Technology*. *Nature and Resources* 30(2): 17-21, 1994.

ON THE WEB:

www.treaty7.org
www.native.org
www.merlin.com.au
www.anac.on.ca
www.afn-ntb.ca

Dene Cultural Institute
The Selkirk Healing Centre
Aboriginal Health Videos
Aboriginal Nurses
Assembly of First Nations

6 EA ON AN INTERNATIONAL LEVEL

This Chapter will examine the situation of health and EA at an international level. The discussion will focus on the following:

- Current international situation
- Environmental factors most pressing on human health
- Responsibility of the World Health Organization (WHO) and other agencies to promote health and the environment
- Progress to date
- Suggested readings

Current International Situation

Canada is not alone in its attempt to strengthen and improve the EA process. Over the last 25 years, industrialized and developing countries alike have contributed to EA's increased acknowledgement as an important contributor to the decision-making process for development projects. Despite considerable progress with respect to laws, methods and procedures over the years, there is still much more to be done for EA to reach its full potential in its applicability within all countries and its ability to contribute to the decision-making process.

"EA has now become institutionalized in over 100 countries and is a standard practice in business."

Dorais, 1996

Environmental Factors Most Pressing on Human Health

The problems that developing countries face are different and much more intense than those of more developed countries. In developing countries, an enormous range of physical and social factors (known as "traditional" hazards) can impede human health. The most prevalent factors are:

- growing population size which increases the pressure on resources and on the ecosystems necessary to support human activity;
- poverty which is closely related to ill-health, premature death and degradation of the environment;
- unsafe and insufficient supplies of drinking water and the provision of basic sanitation and waste management to impede the propagation of infectious diseases;
- inadequate shelter, indoor air pollution; and
- lack of nutritious food, the poor handling of food, and pesticide toxicity.

Rapid and uncontrolled urbanization in developing countries has created severe air and water pollution which compounds the health problems related to poor housing and overcrowding. In turn, overcrowding encourages the spread of infectious and waterborne diseases such as schistosomiasis and malaria.

Developed countries experience health problems related to air pollution, municipal waste, poor management of toxic chemicals and hazardous wastes, as well as those related to unhealthy diets, alcohol, smoking, drug abuse, crime and other psycho-social problems. These are typically referred to as "modern" hazards. Whereas developed countries suffer almost exclusively from modern hazards, developing countries are usually affected by both modern and traditional hazards. As such, it is essential that developing countries incorporate health considerations into EA since they are much more susceptible than developed countries to changes in their physical and social well-being, with the introduction of development projects.

Actions of the World Health Organization and Other Agencies

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity. The enjoyment of the highest attainable level of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic and social condition."

WHO Constitution, 1994

The World Health Organization (WHO) has been at the forefront in the drive to include health on the environment and development agenda. The subject of "health and environment" as studied by the WHO Commission on Health and Development encompasses the health consequences of humans with their physical (i.e., natural and man-made physical, chemical and biological factors), social conditions (i.e., values, customs, and beliefs), and structures (i.e., those affecting access to employment and education, and policies) (WHO, 1993). The four main principles for "environmental health impact analysis" are:

- (1) health should be one of the fundamental considerations in the approval of projects, policies and plans;
- (2) greater consideration should be given to the health consequences of projects, policies and plans in EA;
- (3) EA should provide the best factual information on the health consequences of projects, policies and plans; and
- (4) information on health impacts should be available to the public.

World Health Organization, 1987

Despite a decade of improvements in studying and searching for ways on how human health is influenced by environmental factors, the Commission on Sustainable Development (CSD, 1997) identified several unresolved issues that warrant special attention:

- the need to better integrate health into environmental impact assessment procedures;
- the need for effective and efficient environmental health information systems; and
- the need to improve knowledge of environment-health linkages.

At the **Ottawa Conference** in 1986, the World Health Organization, along with Health and Welfare Canada and the Canadian Public Health Association, agreed on the **Ottawa Charter for Health Promotion**. The Charter sees health in the context of the interaction between the person and the environment. It recognizes the elements of our social environment, including peace, shelter, education, food, income, social justice and equity all as prerequisites for health.

For the first time at an international level, the Charter recognized the fact that our physical environment is important to health, and expressed the need for a "stable ecosystem and sustainable resources". As well, it called for the creation of a supportive environment.

The **Health for All Strategy and Policy** was developed during 1977-79 and was subsequently adopted by all WHO member states. It is based on primary health care, community involvement in health care delivery and the application of appropriate technology for health. The draft renewed Health for All, which will be presented to the World Health Assembly in 1998 for world-wide adoption, emphasizes that health is the "*foundation on which all human endeavour rests*" and that "*health is central to development*". Health and development are linked by four key elements: (i) combatting poverty; (ii) promoting health in all settings and within all sectors; (iii) incorporating health in sustainable development plans; and (iv) governance to ensure that health is central to development. Target 19 of the **Health Policy for Europe** (Health for All 38 Targets, 1991 and draft 1998) recognizes the need to establish environmental impact assessment and monitoring and to linking environment and health information (WHO, 1991; 1998).

After the adoption of the Ottawa Charter, the **WHO Healthy Cities movement** began to take form in 1986 and soon became the pilot project for WHO. In line with "*Think Globally, Act Locally*", the slogan for the United Nations Environment Program, the Healthy Cities program has initiated long-term urban health and development initiatives which aim to improve the health and well-being of people living and working in cities (Tsouros, 1992). The philosophy of the movement is based on four key principles:

- that health should be an integral part of settlements management and development;
- that health can be improved by modifying the physical, social and economic environment;
- that conditions in settings such as the home, school, village, workplace and city, profoundly influence health status; and
- that inter-sectoral coordination for health is necessary at the local level.

The Healthy Cities approach seeks to ensure that health does not remain the exclusive affair of health departments and professionals, but that all development sectors and agencies, including those dealing with housing, local government, agriculture, industry, transport and planning, address health issues in their work. The **Municipal Health Plan** process, involving the collaboration of many different agencies and the use of urban indicators to help us better understand our cities, is a useful tool for removing barriers to integrative approaches, and uses communication, education and information transfer.

Over the last decade, the Healthy Cities project has generated a large amount of practical knowledge concerning strategies and structures for more integrated approaches to health and development at the local level. Examples from all continents were reviewed during the Habitat II Dialogue in June 1996. Networks of cities in all regions of the world have been formed to make health an integral component of settlements planning and management.

In Canada, the **Healthy Communities Project** and **Villes et Villages en Santé** were developed in the late 80's under a joint venture of the Canadian Institute of Planners, the Canadian Public Health Association and the Federation of Canadian Municipalities. It helps communities build a commitment to healthy environments through projects, communication and cooperation. More than 100 municipalities across Canada participated in this effort.

In the early 1990's, a second initiative called **Strengthening Community Health** supported strategies for community collaboration and increased citizen participation. Sponsored by the Canadian Public Health Association, with funding from the Department of Health, the initiative resulted in a wide variety of undertakings. These range from creating provincial networks for coordination and communication to sponsoring local workshops for skills development and training.

At the **United Nations Conference on Environment and Development** – also called the **Earth Summit** – held in Rio de Janeiro (1992), with recommendations from the WHO Commission, more than 150 member states adopted **Agenda 21** – an action plan to guide future strategies for health and environment activities on a national and international level. The Rio process had its roots in the 1972 Stockholm Conference on the environment. In the 20 years between Stockholm and Rio, global environmental threats and the link between environment and development and human well-being became recognized, and the concept of “sustainable development” became a mainstream issue with the Brundtland Commission (WCED, 1987). The international consultation process established in Rio will continue for the next five years.

The WHO Commission also acknowledges that good health and well-being can neither be attained nor maintained in hazardous or deteriorating environments. The WHO has developed a nine-step procedure for integrating health in EA (WHO, 1987). In fact, WHO's new “Paradigm for health: a framework for new public health action”, states the following:

Human health should be seen in a physical, social, behavioural and ecological context. In this holistic model, promotion of health plays a prominent part. Health promotion activities should involve other sectors making a contribution to health, such as education, food, nutrition, and environment.

WHO, 1987

In evaluating progress made since Rio concerning environmental threats to human health, the WHO acknowledges the changing pattern of environmental health hazards and associated health risks, moving from "traditional hazards" (poverty and insufficient development) to "modern hazards" (rapid development and consumption of natural resources). With time and economic development, it has come to be called the "risk transition". A health-and-environment cause-effect framework inspired by work on "sustainable development indicators" by OECD (1993) and CSD (1996) has been developed. It simplified the complex cause-effect relationships operating between driving forces, environmental pressures, environmental states, human exposures, health effects and actions aimed at minimizing these effects (WHO, 1997).

Five years after the Earth Summit: Since the Rio Conference (1992) and the adoption of Agenda 21, the follow-up and up-to-date assessment of the impact of environmental hazards on health at the local, national and global levels are still a major preoccupation. Many international conferences on health and environment have stressed that sustainability concerns not only relate to the environment, but to a whole range of social, economic and political factors. Among these components of sustainability, however, health, in particular, stands out. Health has become a concern for almost every sector in society and not only the "health sector".

Selected International Conferences on Health and Environment and Related Issues Since 1992

1994

- International Conference on Population and Development, Cairo, Egypt
- Second European Conference on Environment and Health, Helsinki, Finland

1995

- UN World Summit for Social Development, Copenhagen, Denmark
- Fourth World Conference on Women, Beijing, People's Republic of China
- Pan American Conference on Health and Environment in Sustainable Development, Washington, USA (PAHO)

1996

- UN Conference on Human Settlements (Habitat II), Istanbul, Turkey
- One Decade after Chernobyl: Summing Up the Radiological Consequences, Vienna, Austria (IAEA/WHO/EU)
- World Food Summit, Rome, Italy

Source : WHO, 1997

The World Health Organization is not the only international organization striving to incorporate health considerations into development projects. The European Union, the World Bank, the United Nations Program for Environment, the Economic Commission for Europe, the International Labour Organization, and the Food and Agriculture Organization are among the other organizations that have requirements or principles for including potential health effects of projects within EA.

Another organization that has been set up to advance the state of the art and effectiveness of EA has been the International Association for Impact Assessment (IAIA). The IAIA, with memberships from numerous countries and international agencies, has recently conducted an international study on the effectiveness of EA which looked at integrated approaches of linking the biophysical, economic and social elements of EA (Sadler, 1996). The study has identified health as an important focus for the application of EA.

The environment-and-health problems faced by many people throughout the world pose a challenge of near Herculean dimensions. It is clear that new approaches are urgently needed to tackle such problems in the future.

WHO, 1997

The next step in looking toward the 21st century should concentrate on resolving the following issues.

Recent international meetings have made it evident that health-and-environment concerns increase in priority on the broad environment and development agenda. The problems facing the health sector today are increasingly complex, multi-disciplinary in nature, often ill-defined and solutions to them are uncertain. New and innovative approaches are needed to integrate and operationalize concepts of environmental sustainability, economic development and community participation. The need for an integrated framework addressing the links between key driving forces, the pressures which they exert on the environment, the resulting state (or quality) of the environment, human exposures and health effects could bring more effective action.

The reassessment of the "Health for All Strategy" to culminate in a Renewal Strategy remains the overriding vision for health in the 21st century. It provides support for many of the key concepts, policies and strategies recommended in Agenda 21. Renewal will incorporate three main dimensions:

- reaffirming the "Health for All" principle;
- applying what has been learned from experience and research in the last 20 years; and
- adapting existing approaches or introducing new ones to face new realities.

Finally, new health information systems and databases are urgently required in support of policy and decision-making, planning and evaluation. Additional resources (i.e., people or funding) are unlikely to be forthcoming in the future of EA. As such, the solution is to promote awareness through education and communication to ensure that those carrying out EA's will recognize the health component to its full extent. The World Health Organization, the United Nations Environment Program, the International Association for Impact Assessment

and other international agencies can play an integral role in educating and distributing information. Special efforts should also be made to ensure that EA practitioners and health professionals in developing countries are aware of the benefits of including health in EA.

Progress Around the World

For the health professionals within Canada, the concept of sustainable development implies the integration of environment, economic and community considerations to achieve the health and well-being of the present generation, without sacrificing the health and well-being of future generations. In November 1993, the status of environmental health impact assessments was reviewed in Malaysia by representatives from China, Hong Kong, Japan, Malaysia, New Zealand, Papua New Guinea, the Philippines and Vietnam. Representatives from the UNDP/World Bank Water & Sanitation and Urban Management Programmes were also present. Participants recognized that although most countries in the western Pacific region had an EA process, human health impacts were not sufficiently taken into account. All of the participants agreed that the following measures were necessary to ensure that health impact assessments become a standard component of EA at a national level: (1) improved intersectoral collaboration; (2) greater circulation of health risk information; (3) establishing guidelines to ensure community involvement; (4) government commitment; and (5) a good regulatory framework and reorientation of health services.

The Commission of the European Communities (CEC) and its 29 member countries adopted the European Charter, a policy regarding health and the environment. The Charter is seen as a major accomplishment in the development of both public health and environmental policies with cooperation among many European countries (WHO, 1990).

Specific examples of recent progress in health impact assessment are:

- The Environmental Division of the Asian Development Bank has produced guidelines dealing with environmental impact assessment, social impact assessment, environmental risk assessment and human health impact assessment.
- Australia has developed a National Framework Document (1992) for health impact assessment in environmental impact assessment.
- The British Medical Association has published (1998) the book entitled: "Health and Environmental Impact Assessment: An Integrated Approach".

- New Zealand's Public Health Commission published its 1995 Guide on Health Impact Assessment.
- The Environmental Division of the Overseas Development Administration has included reference to human health in its environmental manual on assessing development projects.
- The World Bank's Environmental Sourcebook includes reference to the integration of environmental and health impact assessments.

Although major improvements have been made to the EA process in considering health effects, they have mostly dealt with biophysical health and have neglected to sufficiently take well-being into account, although this is slowly changing. The final Chapter will highlight areas that can strengthen health considerations in the EA process.

Suggested Readings

Birley, M.H. and Peralta, G.L., 1992. *Guidelines for the health impact assessment of development projects*. Asian Development Bank Environmental Paper No. 11.

British Medical Association, 1998. *Health and environmental impact assessment: An integrated approach*. Earthscan Publications Ltd., London. Environment and Health Series.

Evan, C., Young, A., Bryant, E., and Calvert, D. 1992. *National framework for health impact assessment in environmental impact assessment*. University of Wollongong.

Giroult, E. WHO Interest in Environmental Health Impact Assessment. In P. Wathern (ed.) *Environmental Impact Assessment: Theory and Practice*. Unwin Hyman, London, U.K., 1988.

Health and Welfare Canada, *Health and Environment in Canada – A Vital Link*, Ottawa, 1992.

Overseas Development Administration, 1992. *Manual of environmental appraisal*. Revised edition. London: Overseas Development Administration.

Public Health Commission, 1995. *A guide to health impact assessment. Guidelines for public health services and resource management agencies and consent applications*. Wellington, New Zealand.

Sadler, Barry for CEAA and IAIA. *International Study of the Effectiveness of Environmental Assessment*. Minister of Supply and Services, Canada, 1996.

- WHO/EU/European Sustainable Cities Campaign/Healthy Cities Network, *Sustainable Development and Health: concepts, principles and framework for action for European cities and towns*, edited by Price and Dubé, Copenhagen, 1997.
- WHO, Healthy Cities project: *A Project becomes a Movement, Review of Progress 1987-1990*, Copenhagen, 1991.
- WHO/OECD/Ayuntamiento de Madrid, *Our Cities, Our Future: Policies and Action Plans for Health and Sustainable Development*, edited by Tsouros and Price, Copenhagen, 1996.
- World Bank, 1997. *Environmental assessment sourcebook update, no. 18 – Health aspects of environmental impact assessment*. Washington, World Bank.
- World Health Organization, *Draft Global Strategy for Health-for-All*, Geneva, Switzerland, 1998 (to be adopted at the World Health Assembly in 1998).
- World Health Organization, *Health and Environment in Sustainable Development, Five years after the Earth Summit*, Geneva, Switzerland, 1997.
- World Health Organization. *Health & Safety Component of EIA*. Report on a WHO Meeting, Copenhagen, Denmark, 1987.
- World Health Organization, *Our Planet, Our Health*, Report of the WHO Commission on Health and Environment, Geneva, Switzerland, 1992.
- World Health Organization, *The Urban Health Crisis*, Geneva, Switzerland, 1993.
- World Health Organization. *WHO Global Strategy for Health & Environment*. Geneva, Switzerland, 1993.

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7

FORGING AHEAD

So what is the future outlook for health in EA? This Chapter will be dedicated to discussing important issues for future consideration including:

- Strengthening health considerations in EA
- Increasing awareness and education
- Strengthening cooperation between EA practitioners and health professionals
- Assessing cumulative health effects
- Dealing with risk perception
- Greater public consideration and community action
- Improving follow-up and monitoring process
- Conclusions
- Suggested readings

Strengthening Health Considerations In EA

Principle 17 from the 1992 Declaration of Principles of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, states that:

“Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.”

After analyzing the progress achieved since UNCED, the UN Commission on Sustainable Development stated, at its fifth session in April 1997, that an unfulfilled expectation was the fact that health impact issues were not included within the environmental impact assessments of development projects. According to the UN Commission, this is due, in part, to the lack of analytical capacity within the ministries of health.

The concept of sustainable development acknowledges the importance of the environment in maintaining and improving health, as well as the significance of social and economic conditions. We need a healthy environment to provide the resources that enable us to be healthy. Sustainable development requires that environmental, economic and community considerations be taken into account in both public and private sector decision-making. An open and transparent reconciliation of economic development, community needs and environmental quality through an evidence-based decision-making process is paramount.

Hopefully, this Handbook has been able to provide you with a better understanding about EA and the current situation of health within it. So where does this leave us? Perhaps our greatest priority is to strengthen health considerations within EA that is consistent with currently-accepted definitions of health (such as that used by Indigenous peoples) as well as the known determinants of health. This requires taking into account a community's social well-being and not just a person's physical well-being.

Procedures, methods and indicators for assessing comprehensive health effects are not as well developed as those for measuring biophysical health effects. However, methods, practices and procedures applied in social impact assessment (SIA) can be an effective tool in EA. SIAs are ideal since they are a reasonably well-developed component of EA with established approaches and measures that could be linked to health. Granted, that while SIA has not yet been effectively related to health and well-being, it does, however, represent an opportunity for viewing health and well-being in a broader context.

There are other challenges facing us in achieving our goal to incorporate health considerations in EA. These challenges include: (1) increasing awareness and education; (2) strengthening cooperation between EA practitioners and health professionals; (3) assessing cumulative health effects; (4) dealing with risk perception; (5) greater public consideration and community action; and (6) improving the follow-up and monitoring process.

Increasing Awareness and Education

The major reason why health is not sufficiently included in EA is lack of awareness. This deficiency can be two-fold: (1) EA practitioners, health professionals, decision-makers, and the public may lack awareness of the benefits of including health in EA; and/or (2) this same group might not be aware of the full scope of EA - or at least the generally accepted definition of health put forward by the World Health Organization and the known determinants of health.

There are also individuals who are of the opinion that health is automatically protected within EA if environmental protection measures are adequate. This is naive and inaccurate since it does not take account of the physical health of humans (e.g., bioaccumulation) or the social, community and psychological aspects of health and well-being.

The World Health Organization has recognized the need to increase the importance and benefits of including health in EA. Four of its objectives state (World Health Organization, 1987):

- (i) inform health professionals (including public health doctors, toxicologists and epidemiologists) of the preventive opportunities offered by EA;
- (ii) persuade decision-makers (i.e., politicians, policy-makers, etc.) and EA practitioners (i.e., EA commissions) of the dangers of not considering health effects;
- (iii) inform EA practitioners of the importance of health in EA; and
- (iv) inform the public of the value of EA in maintaining and protecting health.

Strengthening Cooperation Between EA Practitioners and Health Professionals

As it stands, health professionals need to become more actively involved in the EA process and work in collaboration with EA practitioners to ensure that the full scope of EA is not overlooked. One might point to educating health professionals to convince them of the necessity of their role and responsibility in EA. This approach, however, does not facilitate their involvement and ensure their collaboration with EA practitioners. This suggests that appropriate mechanisms should be implemented to facilitate their cooperation with EA practitioners through joint committees for scoping and determining significance, ensure collaboration between health and environmental agencies, and provide training programs to discuss the responsibilities of the other in EAs.

Health professionals and EA practitioners should also be made aware of the positive repercussions that a thorough EA could have on health and well-being. Ensuring that the physical and social aspects have been properly assessed and dealt with in an EA, can serve as a preventative check to protect against possible physical harm or mental anguish suffered by individuals during or after the implementation and operation of a development project.

Assessing Cumulative Health Effects

In 1992 almost two out of every three people surveyed within Canada said that their health has likely or has definitely been affected by environmental pollution. The risk to health from pollution is undeniable. However, there is a growing consensus that our health is also influenced by other factors. The term determinants of health (see Chapter 1) is now increasingly used to refer to the many factors thought to contribute to the health of populations. They include our social and economic environment, our physical environment, our personal health practices, our individual capacity and coping skills, the availability of health services and other factors such as gender and culture.

Thus the impact of a development project on the biophysical environment is only one of a number of impacts which cumulatively affects the overall health of an individual or a community. Impacts from the development project can be positive (such as the creation of jobs – unemployment and underemployment are associated with poorer health) or negative (release of toxic substances either singly or in complex combinations into the air, water, food or soil).

Historically, environmental impact assessment has focused attention on the movement of contaminants or other hazards through the air, water, food and soil and the resulting human health implications. There is a pressing need to monitor and assess the impacts that development projects have on the other determinants of health so that a truly holistic (cumulative) impact assessment is done.

Dealing with Risk Perception

Risk assessment, the systematic collection, analysis and interpretation of selected environmental or health-related data and the subsequent development of possible options for managing the risks involved with the development project, including consideration of environmental or health benefits is a cornerstone to environmental impact assessment and/or health impact assessment. Risk management involves the selection and implementation of a strategy for mitigating or remediating the risk. Risk management must take many factors into account, including social, economic and environmental considerations.

Attitudes and perceptions about health risks associated with development projects can have an important effect on an individual and/or a community. One of the central challenges for risk communicators is that the risks that have significant health outcomes and the risks that upset the community are not always one in the same. There is often no correlation between the ranking of health risks by experts and public outcry over the same risks. At the individual level, perceptions of health risks can lead to a number of negative health outcomes (i.e., stress, increased blood pressure, sleeplessness, lowering of the individuals immune system, etc.), while at the community level, it can lead to social discord or even to social violence. Development of effective risk communication techniques is a key challenge, so that appropriate environmental, social and economic considerations can be taken into account in both public and private sector decision-making.

Greater Public Consideration and Community Action

The World Commission on Environment and Development's (Brundtland Commission) report, *Our Common Future*, expressed optimism that the world could solve its environmental and economic development problems "in a more open, fair, and just manner". Reconciling the need for economic development, environmental quality and community acceptance necessitates the recognition of the needs for integrated decision making at all levels of society – the individual level, the community level and within and among all levels of government (municipal, provincial and federal). Conflicts arising from risks (real or perceived) associated with development projects need to be examined openly, in an informed manner using the best tools available. The essence of public involvement is two-way communication.

Project managers often delay going to the public until they feel that they have completed their background research and planning. This approach, often referred to as the 'DAD' (Decide, Announce and Defend) approach has often resulted in public outcry and delays in project implementation. Public participation in project planning, before any irrevocable decisions are made, ensures that the views of the community are known and considered when important decisions regarding the project are taken. An important aspect to effective public participation is the extent to which participants are able to exercise power in decision-making, especially when it is perceived that the decision(s) will impact on an individual's health, the health of their children or the health of their community.

Which decision to make is not always clear cut. Many factors must be taken into account during the decision-making process, including the nature of the health/environment concerns and the likelihood that the concerns will occur, uncertainties in the science, health benefits, public perception, economic impacts, social, political and cultural implications, as well as the technical and economic feasibility of the remedial options being considered. However, the final decision and the reasons for the decision, must be clearly articulated to the public that have participated in the identification of the health concerns. Issues that seem obvious to the project manager or health professional, might not be obvious to the impacted community. If the environmental/health impact assessment is perceived to be incomplete or biased toward the interests of the project proponent, it will not be trusted or accepted by the community. The environmental/health impact assessment report should be a comprehensive and balanced summary of the scientific, public, economic and social concerns, and be available to all interested parties.

Improving the Follow-Up Monitoring Process

Chapter 2 examined the follow-up monitoring process and suggested that this phase represented a major area of weakness in EA. Without some sort of systematic follow-up monitoring mechanism, we stand to continuously thwart any chance we might have of accurately assessing the full impact of projects. We cannot continue carrying out a fragmented EA. If carried out effectively, follow-up monitoring could undoubtedly strengthen our knowledge base since cumulative effects influencing physical and social well-being could be better understood once a project has been implemented. This information would consequently serve to provide a more accurate depiction for future assessments of a similar nature. Furthermore, systematic follow-up monitoring could also aid in

the development of health indicators, particularly with respect to social and community health. These indicators could then be useful as baseline information and in determining significance of the potential effects.

Conclusions

As our knowledge base on how to carry out sound environmental assessments improves, all stakeholders in a development project will realize the importance of environmental assessment in decision-making. As our experience in environmental assessment improves, so should the interactions among resource experts, economists, policy experts and environmental, social and human health scientists. The ultimate goal of these interactions is to truly integrate economic, environment and health considerations in decisions regarding development projects, so as to ensure that the basic concepts of Sustainable Development are adhered to.

The goal of this Handbook is to encourage and promote an integrated approach to developing a human health perspective within the framework of environmental assessments. It is not intended to be a standard. Volume 1 consolidates the ideas expressed at the six regional, multi-sectoral workshops held between the fall of 1995 and the spring of 1996, on the role of health professionals in environmental assessment. There was a consensus at all of the workshops that national guidance material on health within environmental assessment was needed in Canada and that it should include advice on assessing effects on socio-cultural health and occupational health as well as physical health. This would be consistent with the World Health Organization's definition of health and the known determinants of health. It was suggested that because different people have different levels of familiarity with the issues associated with including health in environmental assessment, there may be a need to prepare more than one guidance document. Volume 1 of the Handbook introduces the concepts of health impact assessment and presents the rationale for the necessary presence of the health sector in the area of environmental assessment, as well as a summary of current practices in Canada and other countries. Volume 2 will present criteria for conducting an analysis and provide detailed examples of impacts as a reference to health professionals, based on the principles of sustainable development. The third volume of the Handbook will provide a summary of the methodological approaches which are widely used in Canada at the present time. The three volumes will be finalized in the year 2000, once the consultations currently under way have been completed.

Even though this Volume has undergone extensive multi-stakeholder consultations, it is important to bear in mind that the Handbook was designed in order to allow for expansion and modification in the future. The Handbook is published as a binder, which allows pages to be inserted, deleted or modified with relative ease. Changes to this Volume or Volumes 2 and 3 will be recorded on the inter-net at the website address:

<http://www.hc-sc.gc.ca/oeha> (for English); and
<http://www.hc-sc.gc.ca/behm> (for French).

and will be available for downloading free of charge. Efforts are underway to have the Handbook (all three volumes) translated into other languages as well, so that the Handbook can serve a wider audience. The translated versions will be posted at both the English and French websites listed above.

The overall objective of the three Volumes is to develop and promote partnerships and new alliances of support for health impact assessment. The development of leadership in this new evolving area so that health impact assessment can be sustained as a continuing process within environmental impact assessment at all levels is an important strategy to mobilize greater social and political commitment for the World Health Organization's total Health-for-All movement. It is hoped that these three Volumes will promote self-reliance and enable others outside of the health professions, particularly at the community level, to take greater responsibility for their own health and the health of their community, through informing and educating them and developing their own leadership potential.

Suggested Readings

United Nations, *Report of the United Nation Conference on Environment and Development*. Rio de Janeiro, Brazil, June 3-14, 1992.

World Health Organization. Health and Safety Component of Environment Impact Assessment. Report on a WHO Meeting. Copenhagen, Denmark, 1987.

APPENDIX

Glossary

Decision-Makers: Persons (e.g., cabinet ministers, senior officials, regulatory authorities, etc.) who help determine if the project should be permitted to proceed or not.

Environmental Assessment (EA): A comprehensive and systematic process, designed to identify, analyze and evaluate the environmental effects of a project in a public and participatory manner; environmental assessment involves the use of technical experts, research and analysis, issue identification, specification of information requirements, data gathering and interpretation, impact prediction, development of mitigation proposals, external consultations, and report preparation and review. In this Handbook, the term "environmental assessment" is used synonymously with "environmental impact assessment", "impact assessment", etc.

Environmental Assessment Practitioner: someone who is involved in carrying out an environmental assessment (i.e., government employee, knowledgeable person in the EA field, etc.)

Government Departments/Ministries or Agencies: The federal, provincial, and/or territorial government institutions partaking or providing guidance in the EA.

Health: A complete state of physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1967). Consistent with this definition, health has been defined in this Handbook in terms of its physical and socio-cultural dimensions. "Health and well-being" is synonymous with this definition of "health", and has been used to emphasize the inclusion of physical health and socio-cultural well-being.

Health professional: A person who has formal education and/or experience in how the environment can affect human health and well-being. Includes professionals in the medical field (i.e., doctors, nurses, epidemiologists, toxicologists, etc.), professors and experts in the social science field, and the occupational health and safety experts in government and industry.

Health promotion: The combination of educational and environmental supports for actions and conditions of living conducive for health. "Environmental", in this context, usually refers to the social, political, economic, organizational, policy, and regulatory circumstances bearing on health and not the physical environment nor the provision of medical services.

Project: Any proposed physical undertaking or activity required to undergo an EA. Most EA legislation defines the types of development projects subject to EA requirements.

Proponent: An individual, organization or company that proposes a development project.

Public: Local residents, environmental groups, Aboriginal people, local businesses and other citizens. Does not include proponents or government departments (see definition of stakeholder).

Social Impact Assessment: The process of identifying, assessing and mitigating the social effects of development projects.

Social learning theory: Supports the ideas that people self-regulate their environments and actions and, though people are acted upon by their environments, they also help create their surroundings.

Stakeholder: Any individual, organization or company that has an interest, financial or otherwise, in a project. Types of stakeholders commonly associated with EAs include the proponent, government departments, local residents, environmental groups, Aboriginal people, local businesses and others (see definition of the public).

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Medical Services Branch
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Québec, Québec

Activities Carried Out by the Task Force

Chronology of Events:

- Sept. 1992 Task Force Formed
- Sept. 1993 Review of National and Provincial/Territorial Literature
- Mar. 1994 1st Draft (reviewed by Task Force)
- Sept. 1994 2nd Draft (reviewed by Federal/Provincial/Territorial
Committee on Environmental and Occupational Health)
- Oct. 1994 3rd Draft (translated and distributed for comment)
- Sept. 1995 Workshop Halifax (multistakeholder)
- Nov. 1995 Workshop Winnipeg (multistakeholder)
- Nov. 1995 Workshop Montreal (multistakeholder)
- Dec. 1995 Workshop Toronto (multistakeholder)
- Jan. 1996 Workshop Vancouver (multistakeholder)
- Mar. 1996 Workshop Ottawa (federal government)
- June 1996 Consolidated Workshop Proceedings Published
- Apr. 1997 Draft Canadian Health Impact Assessment Guide,
Volume 1: The Beginner's Guide